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& Computer Shopper,v15,n12,p660(2),Dec.1995.

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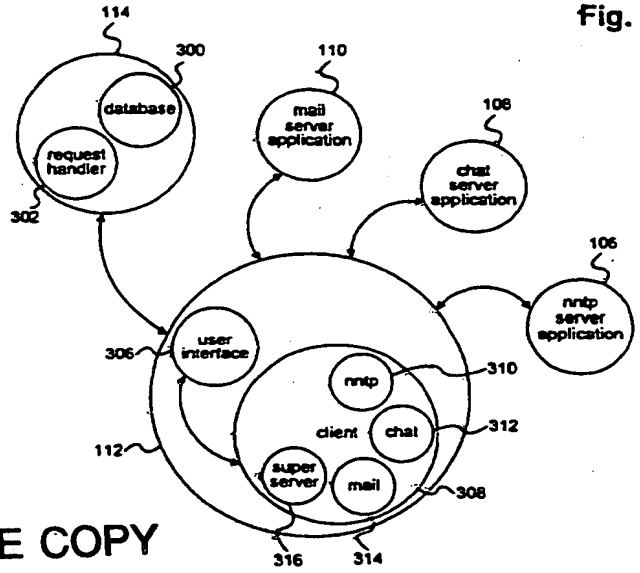
COMPUTER, INSPEC, WPI.

(54) Abstract Title
Interface for computer discussion technologies

(57) The system provides an enhanced interface to news and chat forums. Structurally, it includes a super-server application 114, a database 300, and a client applet 112. The super-server application is implemented on a server (104d, Figure 1) to maintain and update information representative of the user's environment and interface, and to handle and reply to requests sent by a user of the client system. The client applet accesses information included in the super-server application and database to augment the information included in standardized protocols such as NNTP and Internet Relay Chat. Using the augmented information, the client applet is adapted, at the user's request; to configure the user's interface and to organize data and information received from a wide area network (WAN), such as the Internet, through the super-server application; to create the user's personal profile and incorporate it into the the data and information received from the WAN; and to select data for storage in a device. An enhanced interface is provided which presents network news and chat forums in an easily understandable fashion.

Fig. 3



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

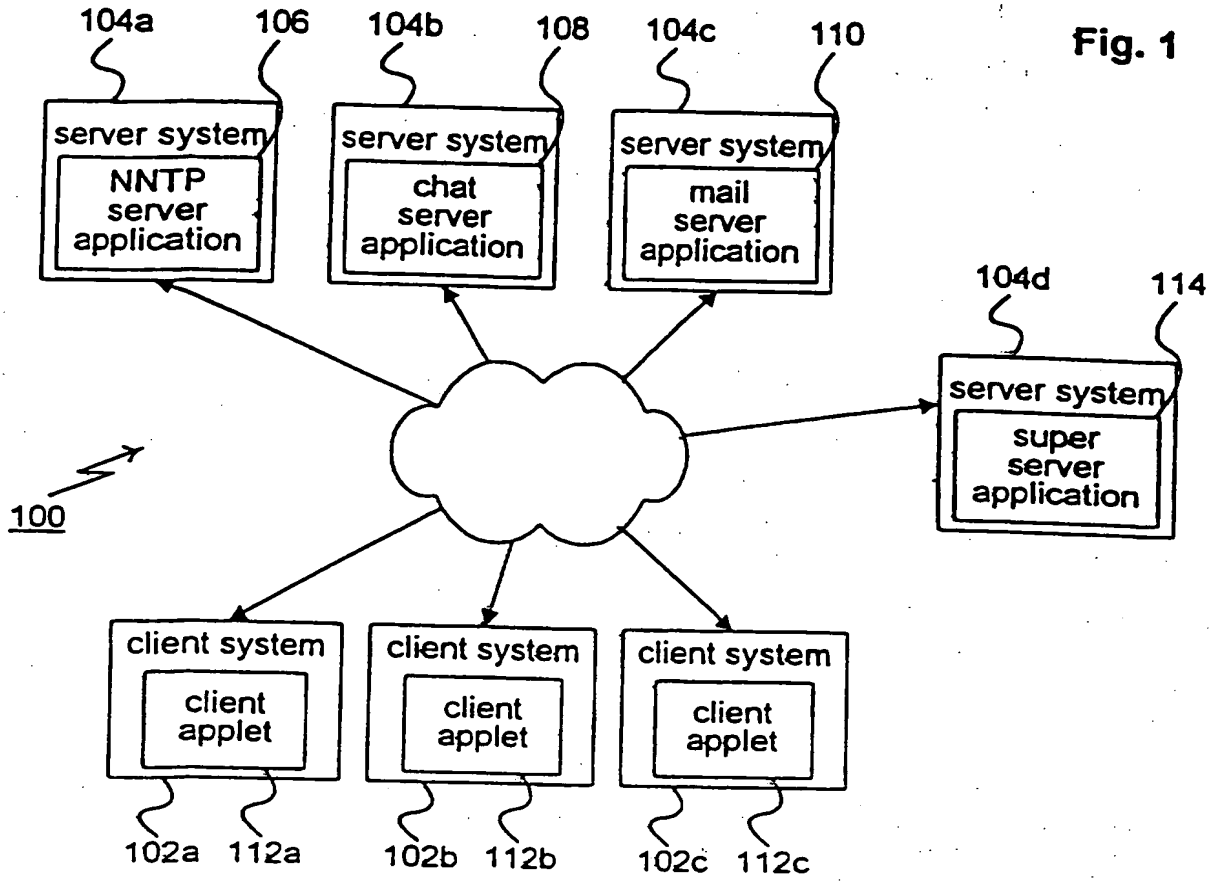

104a
106
104b
108
104c
110
server system
NNTP server application
server system
chat server application
server system
mail server application
104d
114
server system
super server application
100
client system
client applet
client system
client applet
client system
client applet
102a
112a
102b
112b
102c
112c

Fig. 1

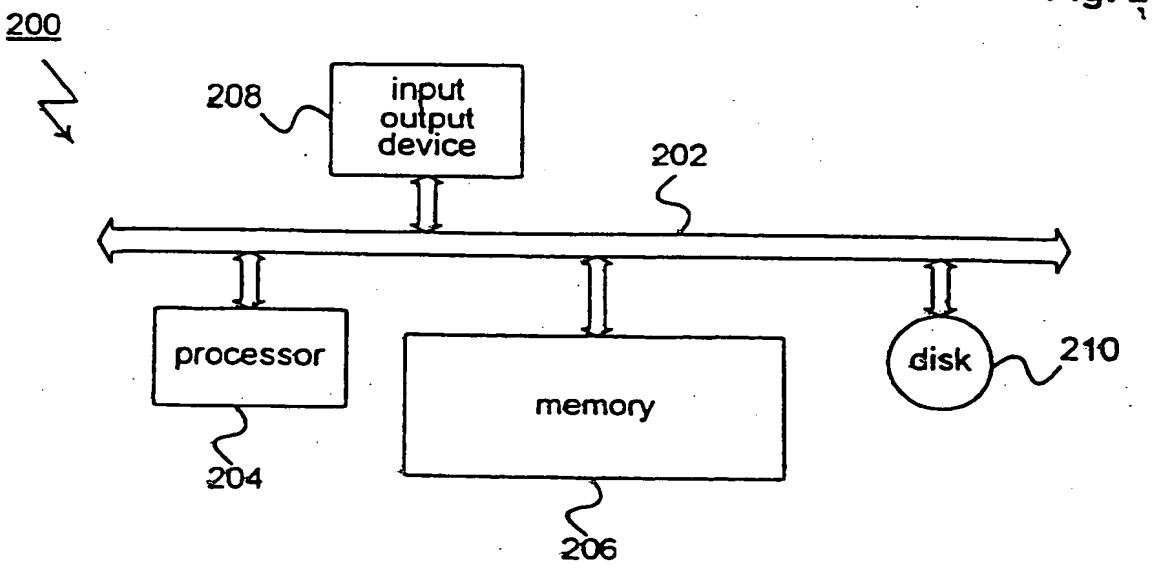
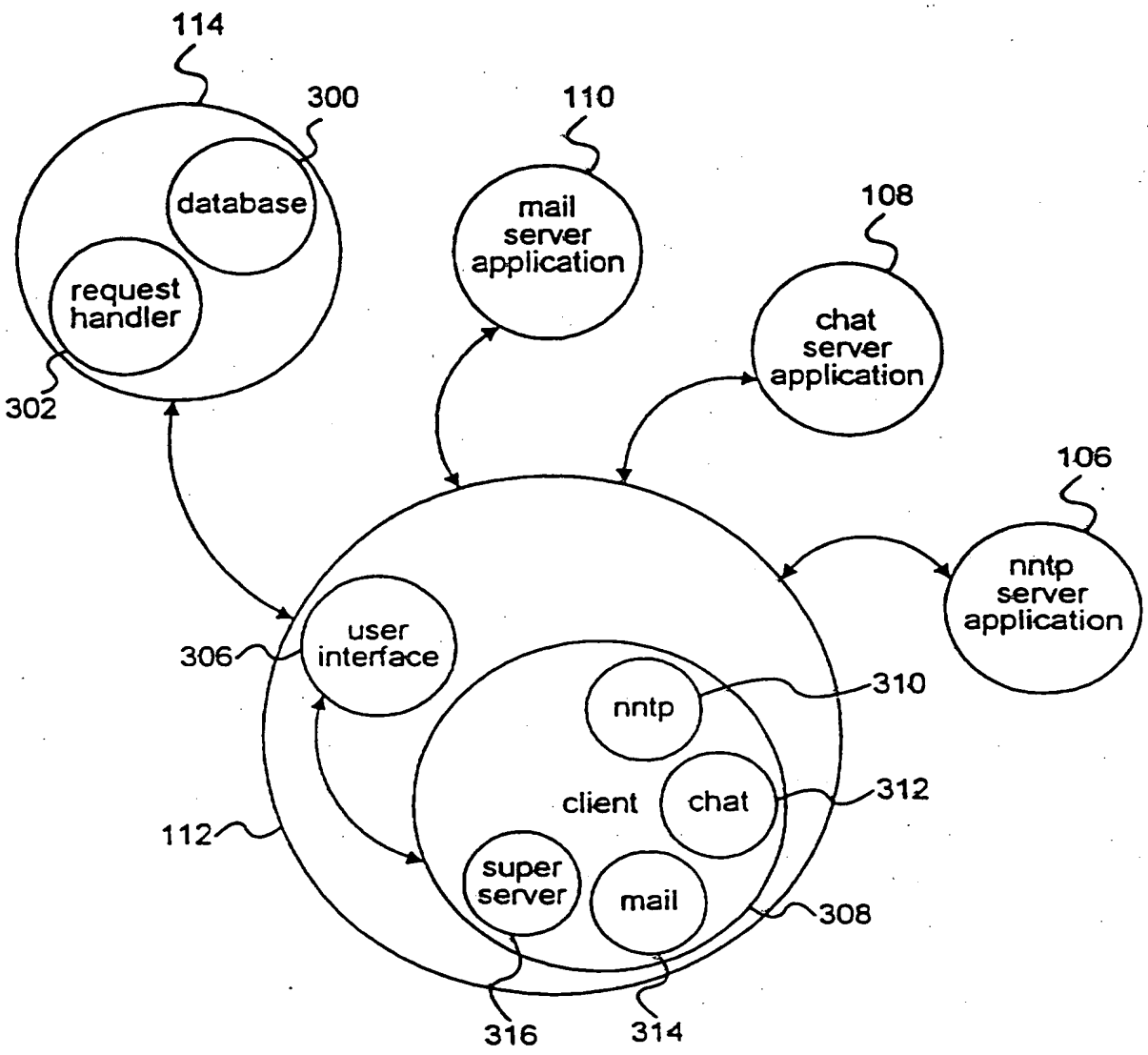

200
208
input output device
202
processor
memory
disk
210
204
206

Fig. 2

Fig. 3


114
300
database
request handler
302
110
mail server application
108
chat server application
106
nntp server application
306
user interface
310
nntp
client
chat
312
112
super server
mail
308
316
314

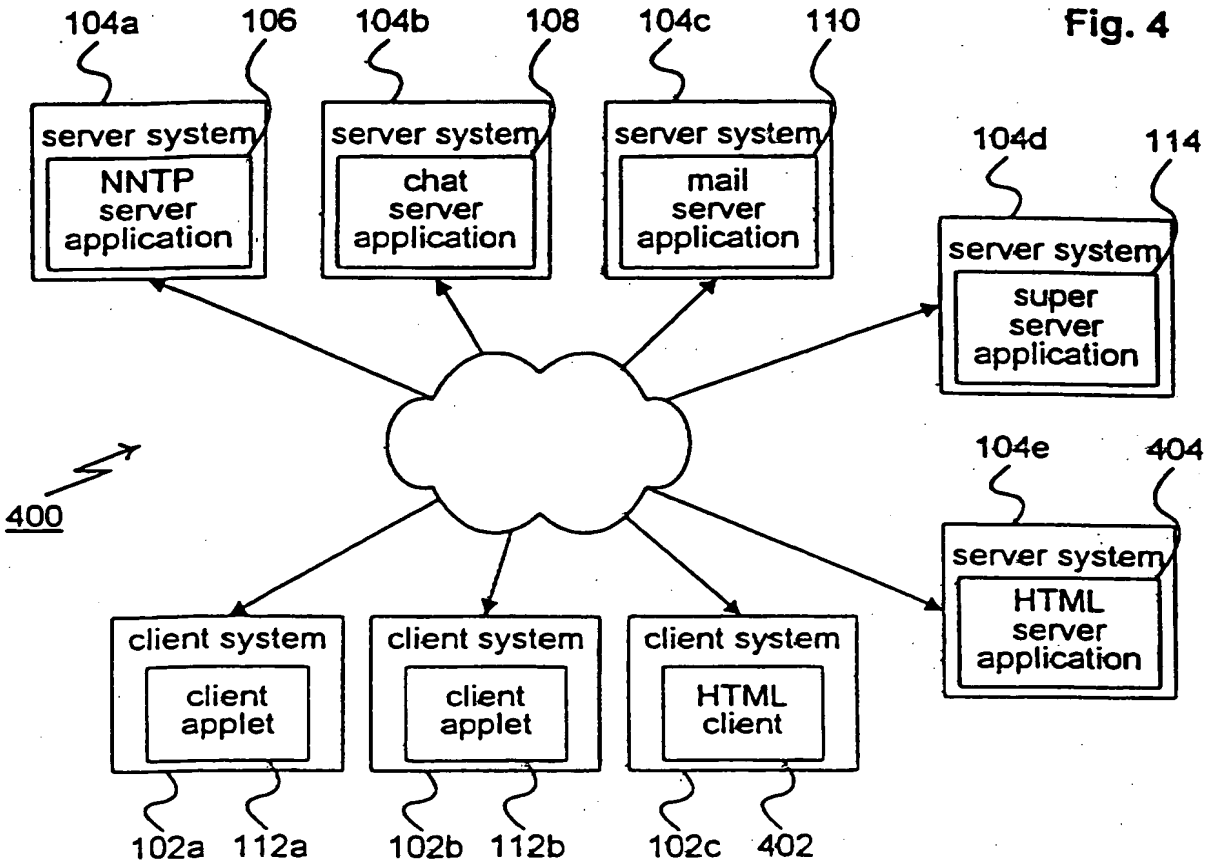
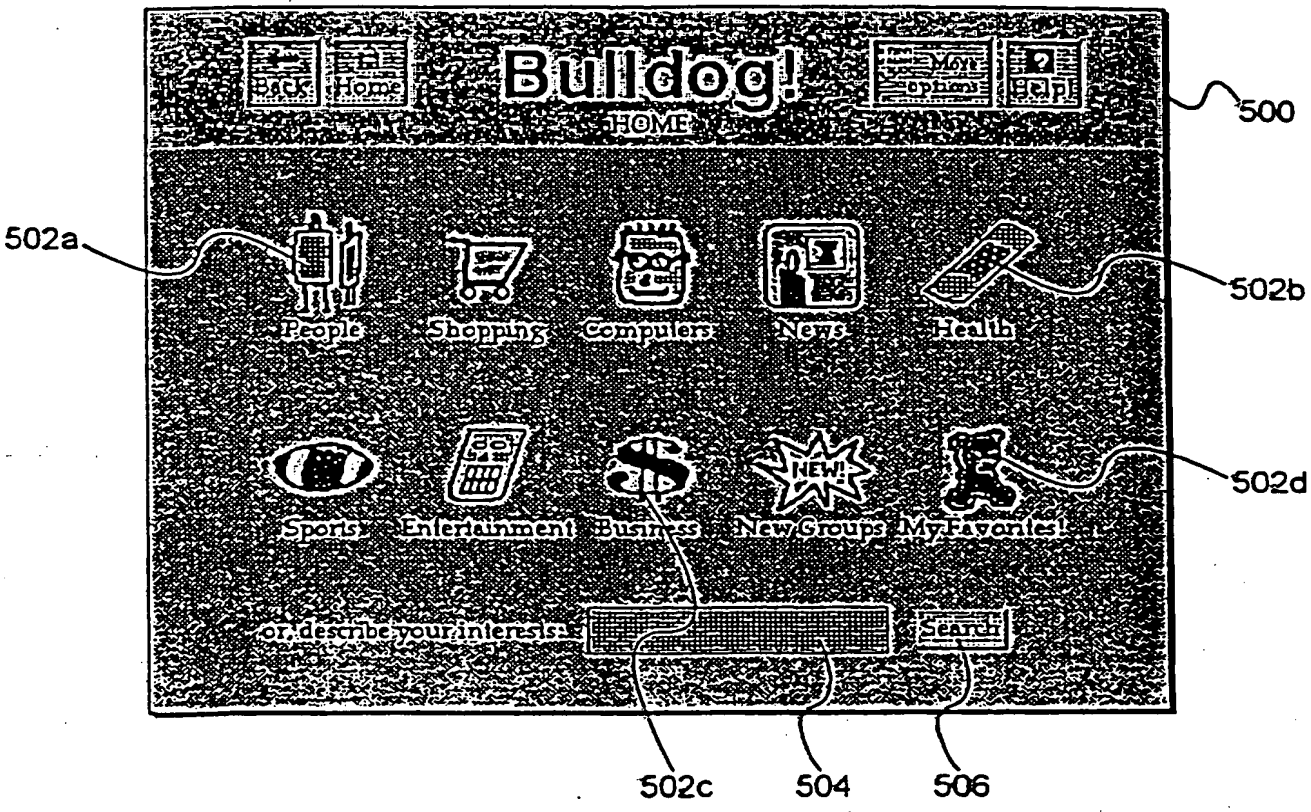

104a
106
104b
108
104c
110
104d
114
104e
404
server system
NNTP server application
server system
chat server application
server system
mail server application
server system
super server application
server system
HTML server application
400
client system
client applet
client system
client applet
client system
HTML client
102a
112a
102b
112b
102c
402

Fig. 4

Fig. 5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HOME
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Help
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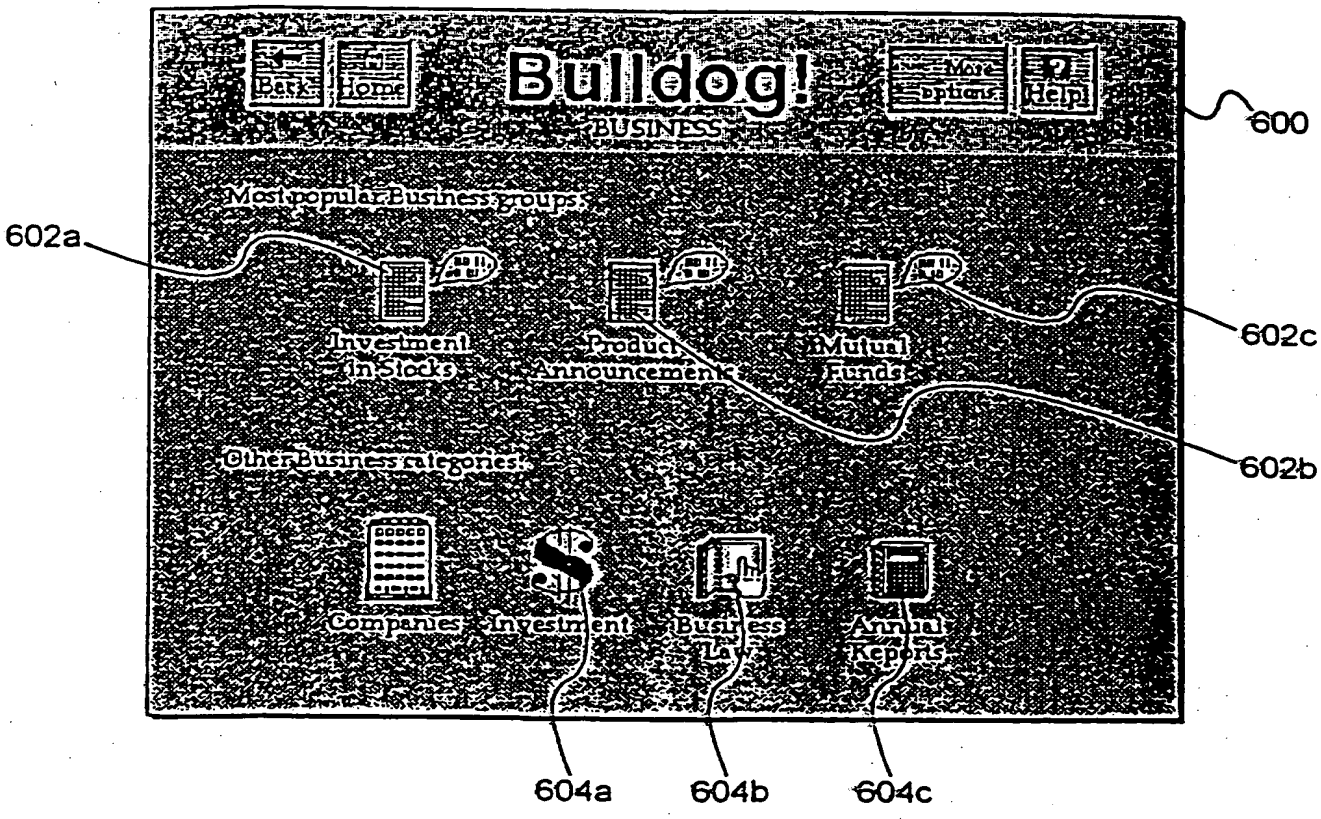
502a
502b
People
Shopping
Computers
News
Health
Sports
Entertainment
Business
NEW!
New Groups
My Favorites!
502d
or, describe your interests
Search
502c
504
506

Fig. 6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Home
More Options
Help
BUSINESS
Most popular Business groups:
Investment in Stocks
Product Announcements
Mutual Funds
Other Business categories:
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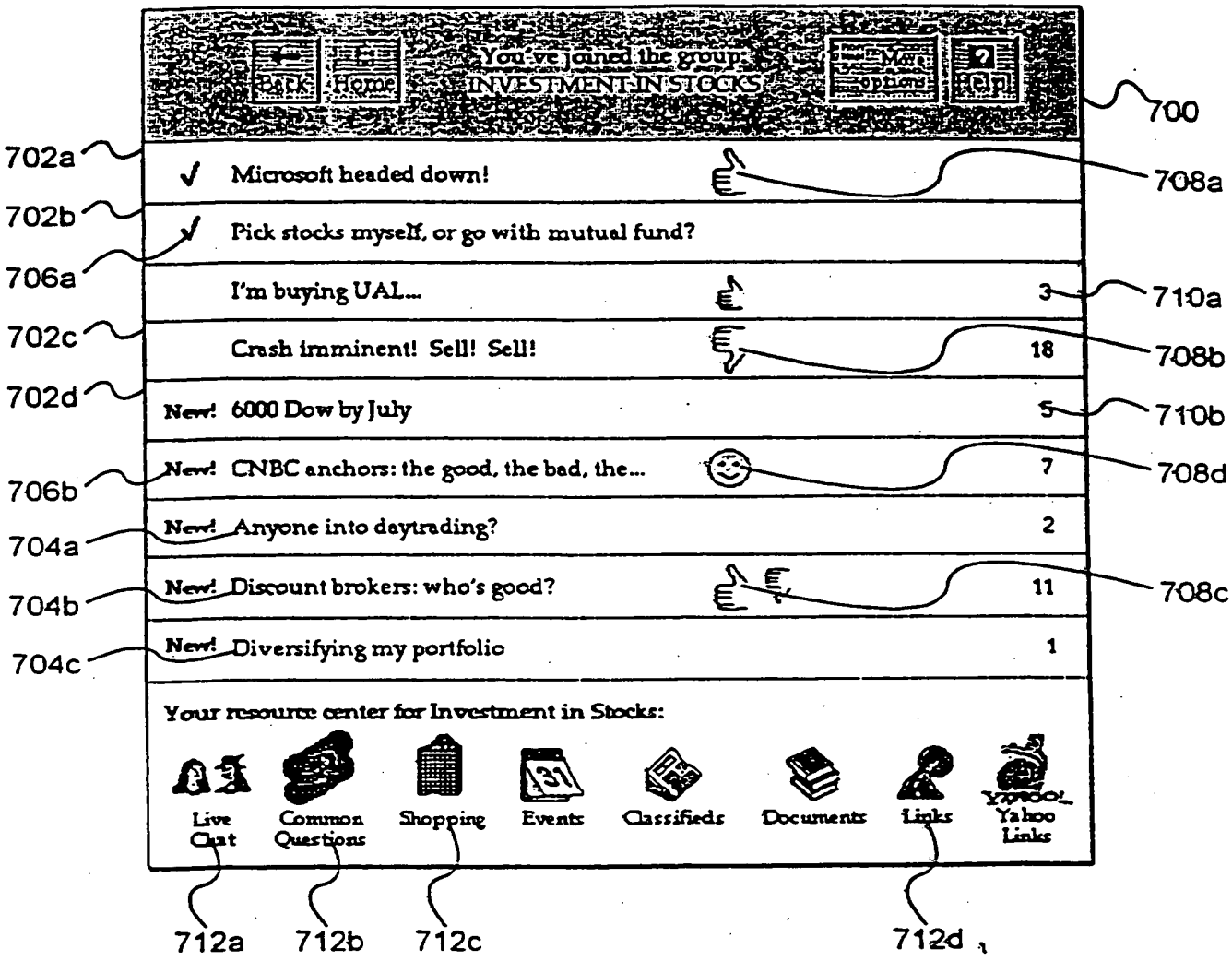
Investment
Business Law
Annual Reports
600
602a
602b
602c
604a
604b
604c

Fig. 7


You've joined the group:
INVESTMENT IN STOCKS
Back
Home
More options
Help
700
Microsoft headed down!
Pick stocks myself, or go with mutual fund?
I'm buying UAL...
3
Crash imminent! Sell! Sell!
18
New! 6000 Dow by July
5
New! CNBC anchors: the good, the bad, the...
7
New! Anyone into daytrading?
2
New! Discount brokers: who's good?
11
New! Diversifying my portfolio
1
Your resource center for Investment in Stocks:
Live Chat
Common Questions
Shopping
Events
Classifieds
Documents
Links
Yahoo Links
702a
702b
706a
702c
702d
706b
704a
704b
704c
708a
708b
710a
710b
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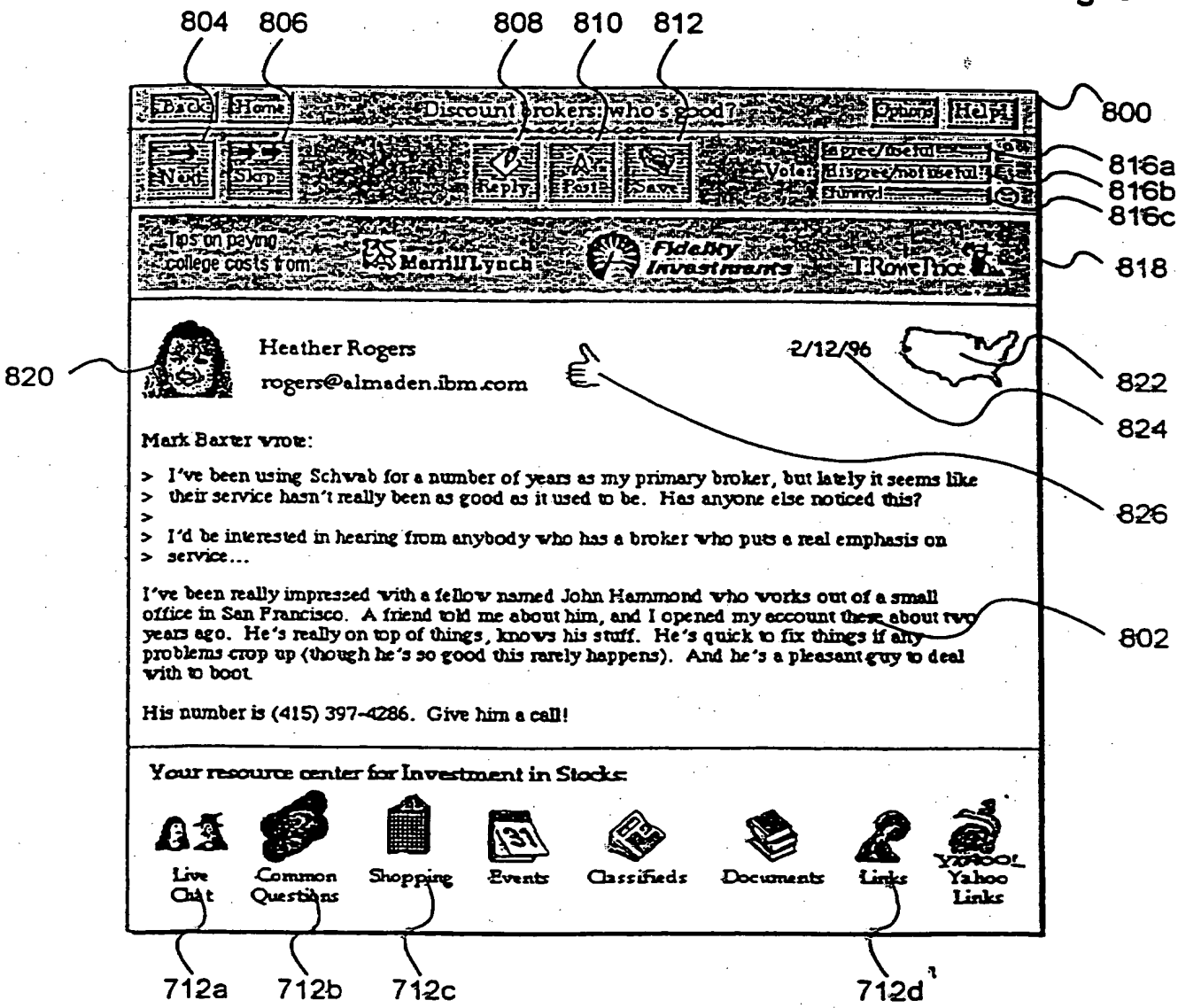
708c
712a
712b
712c
712d

7/13

Fig. 8



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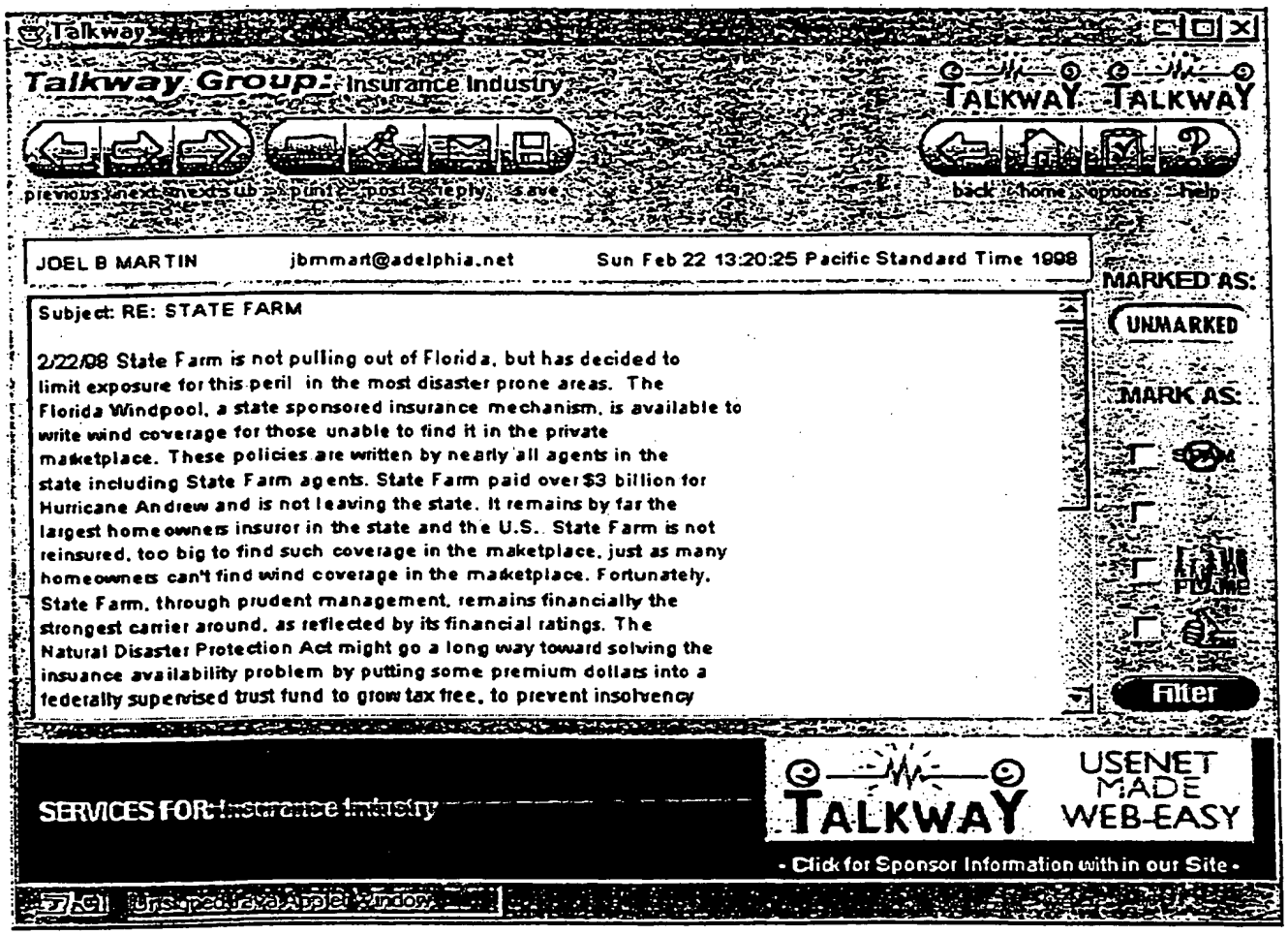
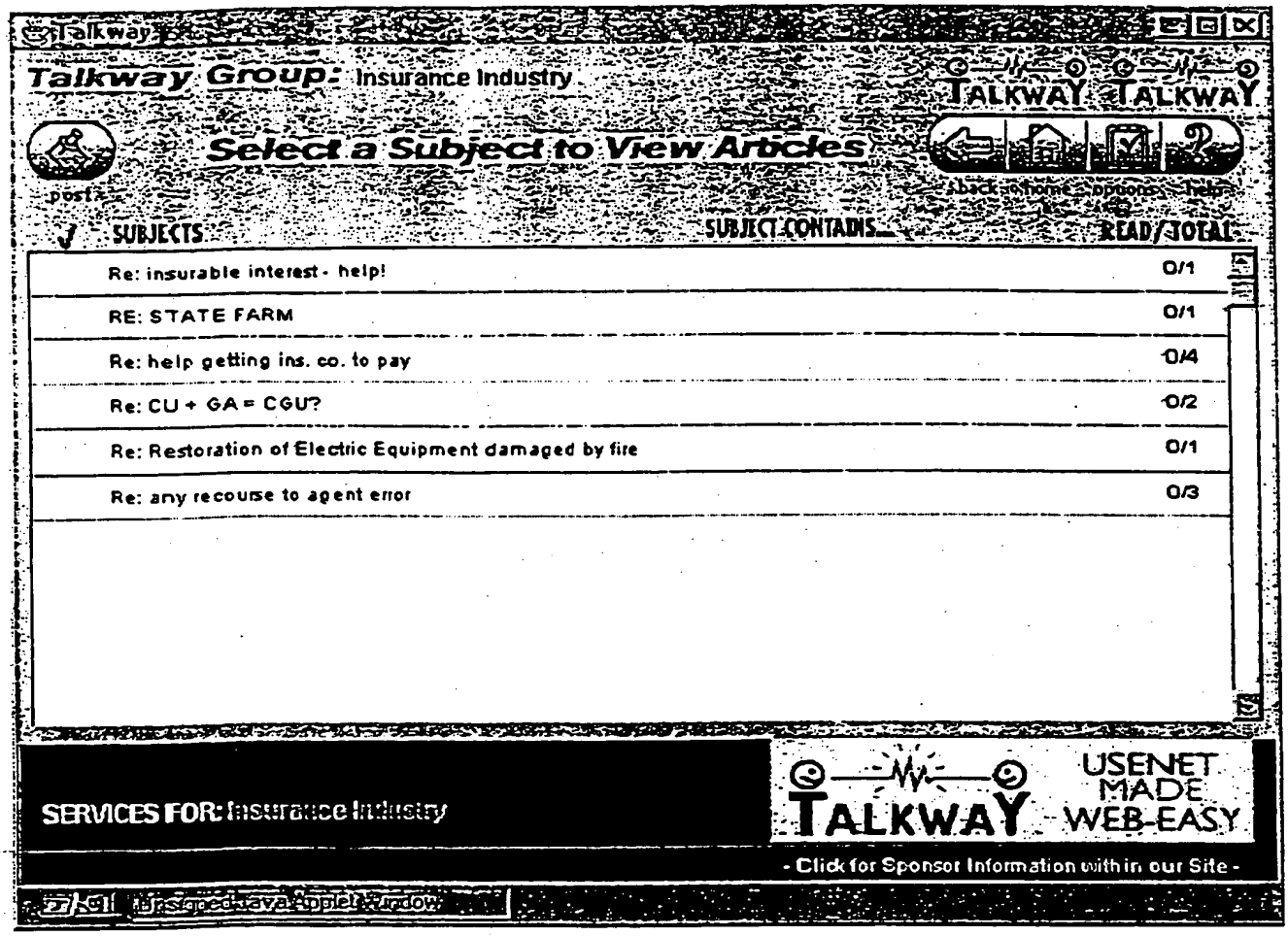
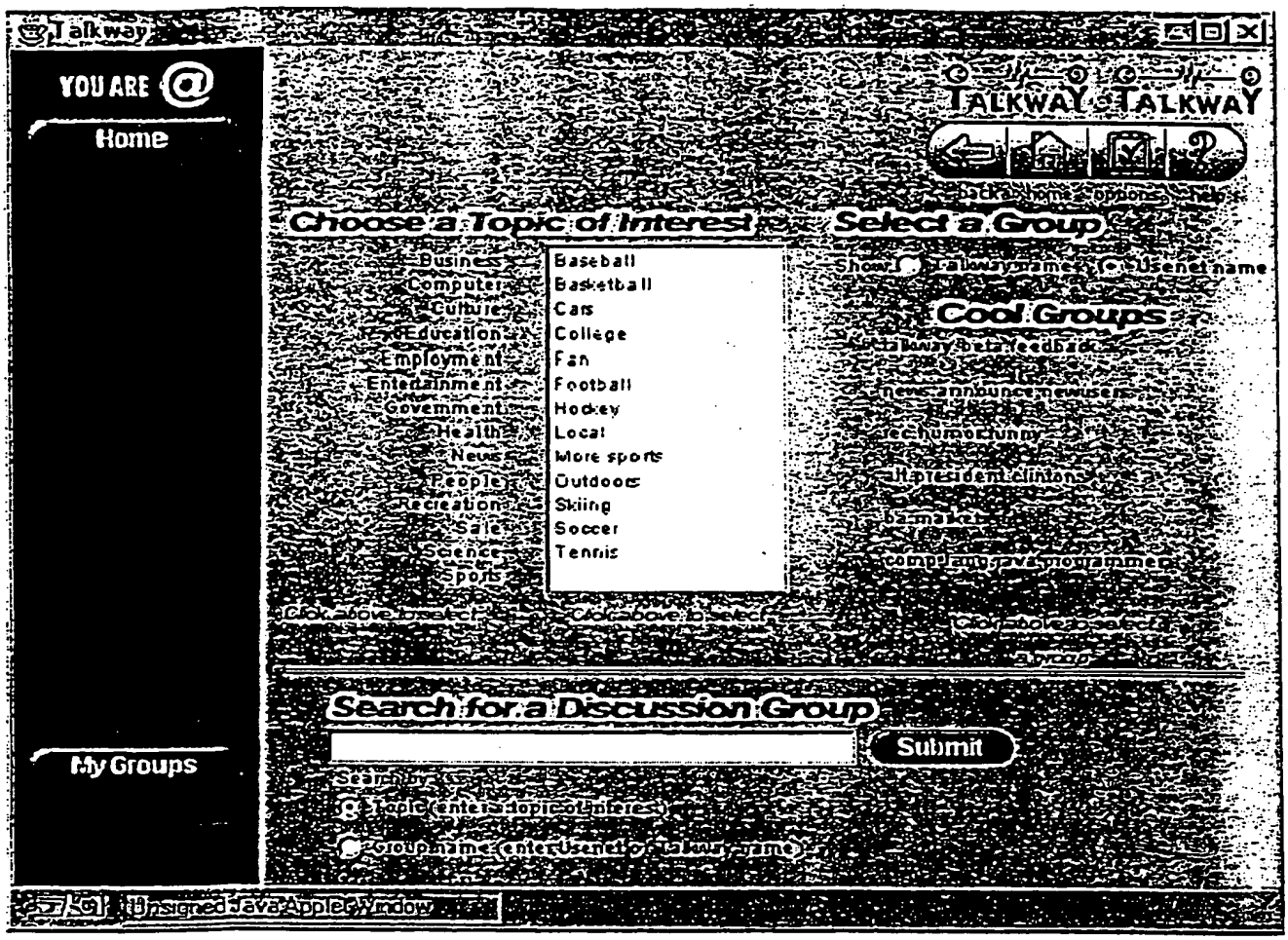


Article Screen
Fig. 9



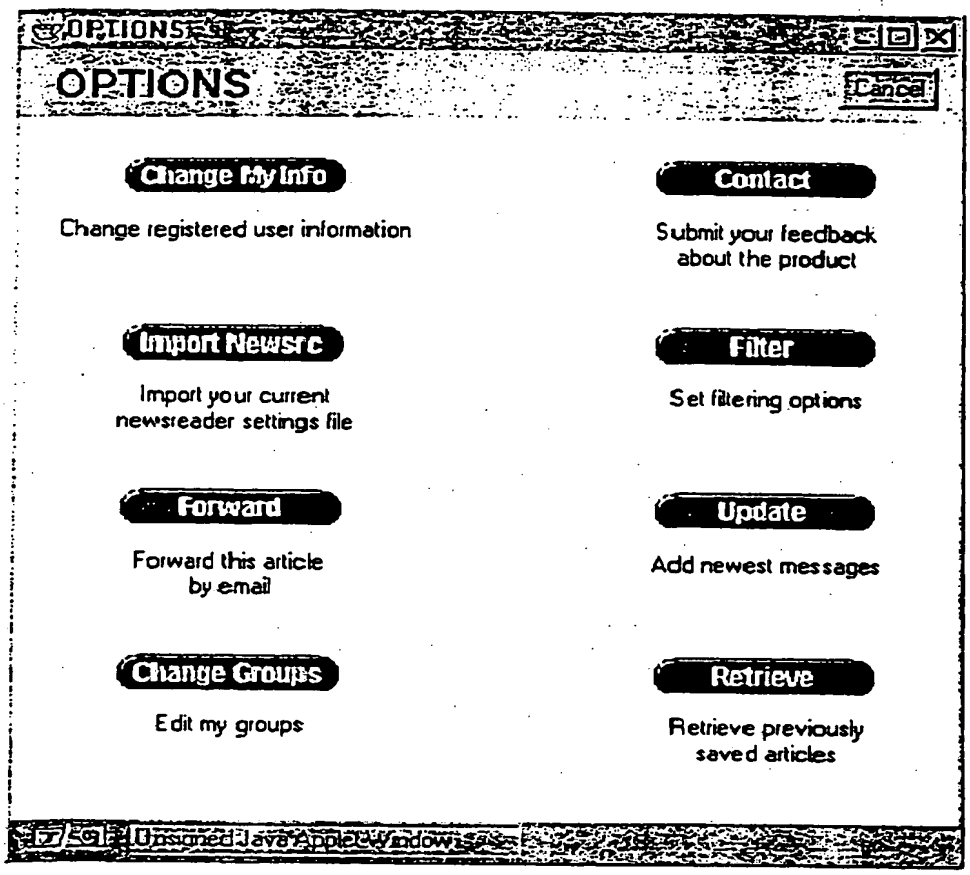
List Article Screen

Fig. 10



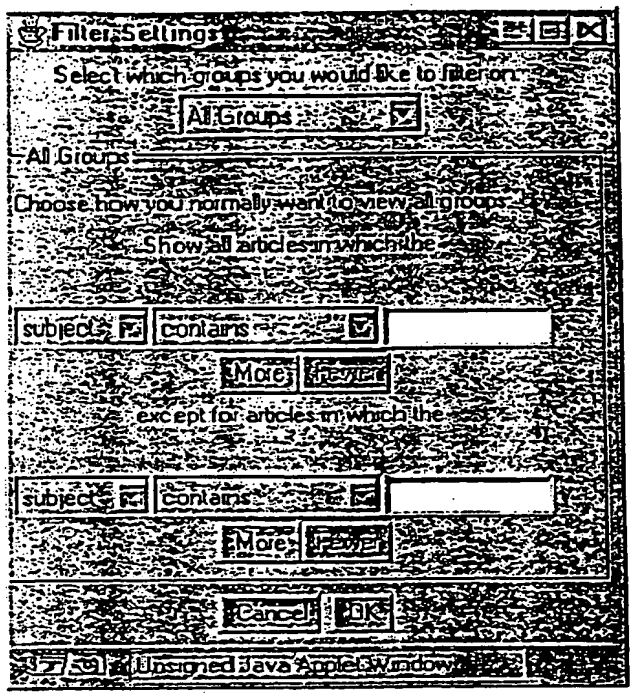
Opening Screen

Fig. 11



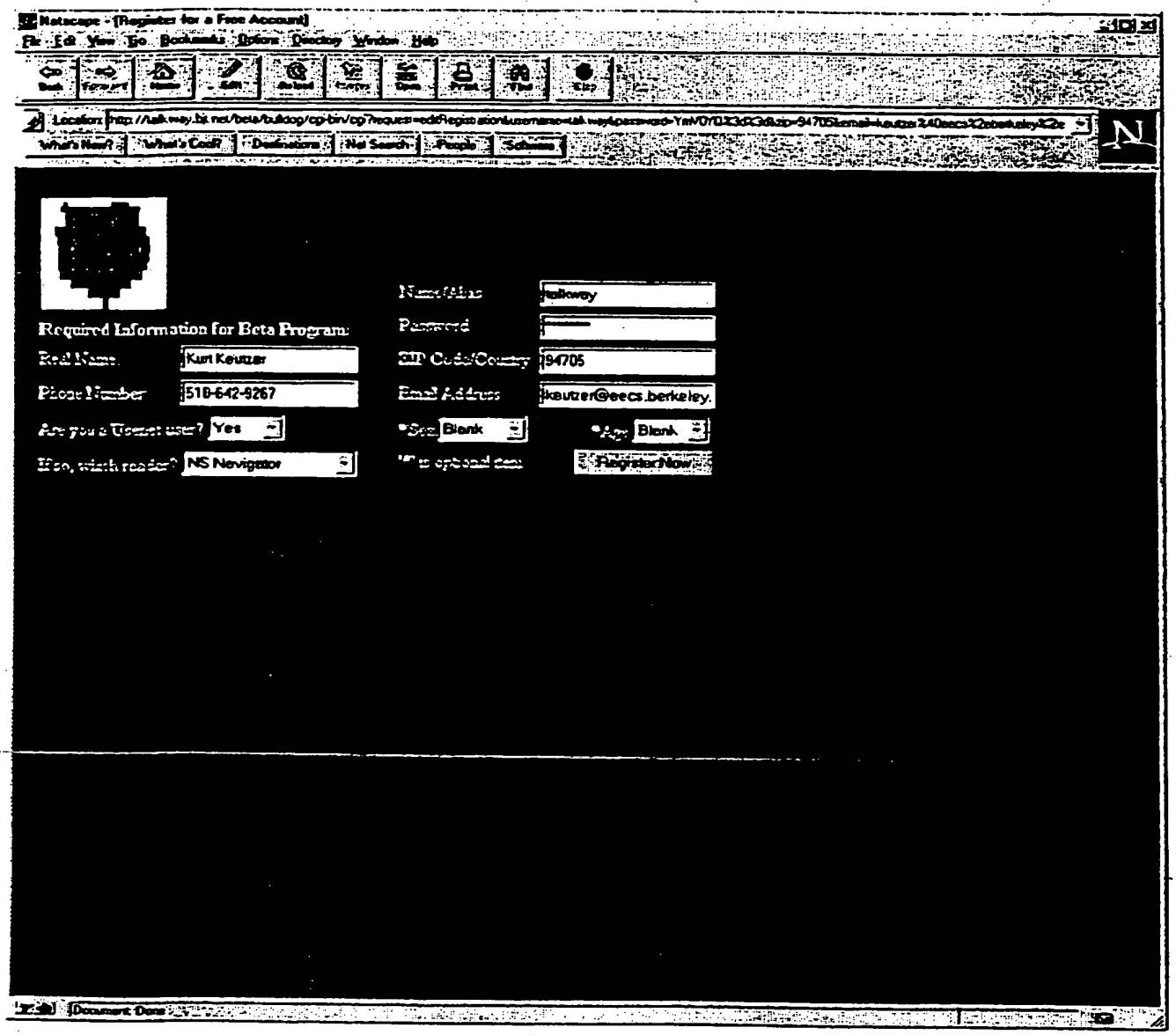
Options Screen

Fig. 12



Filter Screen

Fig. 13



Registration Screen

Fig. 14

System for Enhanced Discussion Technologies

The following application claims ~~the benefit of~~ priority from US Provisional Application Serial No. 60/040,028 entitled "Usenet News Reader" by Richard Simoni and Douglas Pan, filed 3/4/97, the disclosure of which is incorporated in this document by reference.

The present invention relates generally to computer discussion technologies. More specifically, the present invention is a method and apparatus for providing enhanced interfaces to computer discussion technologies such as electronic news, electronic mail, voice mail, Internet Chat, voice conference, video conference, fax by email, etc.

Electronic news is a discussion technology that has become familiar to computer users worldwide. In a typical electronic news system, users post articles to newsgroups. Users also read and respond to articles posted by other users. Each article and response is archived for a period of time, allowing users to participate in discussions in a non-real time fashion.

Within the Internet, the most widely used form of electronic news is USENET news. USENET news began with a simple process whereby users exchanged articles via electronic mail. Starting from this simple beginning, USENET news has evolved into a complex system where news articles are archived on news server systems. The archived news articles are transferred, on demand, to client systems using the network news transfer protocol (NNTP)

described in Internet RFC 977. Users of the client systems view the news articles utilizing the user interfaces provided by programs known as news readers.

USENET news has proven to be an effective and popular form of electronic news. In fact, thousands of different USENET newsgroups are now available within the Internet, and millions of articles are posted each week. The basic USENET technology is also widely deployed within the internal networks, or intranets, of many companies and organizations. These companies and organizations use USENET-style news server systems and NNTP to distribute articles within their internal computer systems.

In spite of the overall effectiveness of USENET news, practice has shown that there is still a need for improvement within this technology. In particular, practice has shown that a great many users find the user interfaces provided by many news readers to be somewhat arcane and difficult to use. Even interfaces that do not appear to be arcane still lack many of the features that users have come to expect when using other programs, such as browsers for the World Wide Web. Thus, there is a need for improved user interfaces that simplify the use of USENET news.

Unfortunately, production of improved user interfaces has proven to be a difficult task. This difficulty is compounded because of the widespread use of the USENET technology. Simply put, there is a large installed base of news readers and a large installed base of news server systems. Any changes made to provide an enhanced news reader program must be compatible with a large amount of preexisting software. In particular, this means that it is impractical to

make changes to the news server systems or to NNTP. The need to provide an enhanced user interface while maintaining compatibility with existing software is not unique to USENET news. In fact, this needs exists within the scope of other discussion technologies including non-USENET electronic news systems, bulletin board systems, and chat systems. Thus, a need exists for an enhanced news reader user interface that is compatible with existing USENET and related technology.

The present invention includes a method and apparatus for providing enhanced interfaces to computer discussion technologies such as electronic news. A representative environment for the present invention includes a computer network having server and client computer systems. Preferably, the present invention is intended to be used in Internet or intranet environments where client systems can include workstations, personal computers, network computing systems and Internet-enabled televisions. Within the preferred environment there are one or more news servers. Preferably, the news servers supply news articles using the NNTP protocol described in Internet RFC 977 (the disclosure of RFC 977 is incorporated in this document by reference). Alternatively, other protocols and news delivery systems may be used.

For the purposes of the present invention, one or more of the server systems included in the computer network are designated as super-server systems. Each super-server system includes a super-server application. The super-server application provides information within the computer network using a super-server protocol (SSP). The information provided by the SSP supplements the news articles provided by the news servers. Within compatible news reader programs, the information provided by the SSP enables the use of enhanced user interfaces.

The information provided by the SSP is intended to be used within a range of different news reader types. For one embodiment of the present invention, a news reader is provided by a client applet. The client applet is

preferably implemented as a Java® applet that is downloaded on demand to the network's client systems. Once downloaded, the client applet is executed under control of a Java®-compatible browser, such as Netscape Navigator®. (Java is a registered trademark of Sun Microsystems Inc.) (Navigator is a registered trademark of Netscape Communications Corporation). During execution, the client applet communicates with the super-server system and the news server systems. The client applet uses the information included in the SSP to provide an enhanced interface to electronic news.

The interface provided by the combination of the super-server system, SSP and client applet includes many features that simplify the task of accessing electronic news. More specifically, when used in combination with a browser, the present invention provides a "web-like" interface to electronic news. The web-like interface sorts newsgroups into logical categories. Each category has an associated name that describes the contents of the category's newsgroups. Each category or newsgroup may also have one or more associated chat forums. The grouping of newsgroups and chat forums into categories provides users with an intuitive guide to the diverse subject matter of the newsgroups that are available on the Internet.

The categorization of newsgroups and chat forums also allows the web-like interface to respond intelligently to a user's patterns of use. For example, an advertisement for an online music store can be sent to users who routinely access a category of music newsgroups. As another example, if numerous users

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routinely access a group of categories, a new super category may be created to match the needs of those users.

Advantages of the invention will be set forth, in part, in the description that follows and, in part, will be understood by those skilled in the art from the description or may be learned by practice of the invention. The advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims and equivalents.

The accompanying drawings, that are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and, together with the description, serve to explain the principles of the invention.

Figure 1 is a block diagram of a computer network shown as a representative environment for the present invention.

Figure 2 is a block diagram of a host computer system in accordance with an embodiment of the present invention.

Figure 3 is a block diagram showing the relationship between the software components of an embodiment of the present invention.

Figure 4 is a block diagram of a computer network shown as a representative environment for an alternate embodiment of the present invention.

Figure 5 is a diagram showing a first screen of a user interface as used in an embodiment of the present invention.

Figure 6 is a diagram showing a second screen of a user interface as used in an embodiment of the present invention.

Figure 7 is a diagram showing a third screen of a user interface as used in an embodiment of the present invention.

Figure 8 is a diagram showing a fourth screen of a user interface as used in an embodiment of the present invention, and

Figures 9 to 14 are diagrams showing additional screens of a user interface as used in an embodiment of the present invention.

Reference will now be made in detail to preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

ENVIRONMENT

In Figure 1, a computer network 100 is shown as a representative environment for the present invention. Network 100 includes a mixture of client systems 102a through 102c and server systems 104a through 104d. The number of client systems 102 and server systems 104 is intended to be representative in nature. Thus, Figure 1 could include any number of client systems 102 or server systems 104. Client systems 102 and server systems 104 may be selected from a wide range of computer system types including personal digital assistants, workstations and personal computers. Client systems 102 may also comprise appropriately configured network computing systems or television-compatible Internet systems.

Referring briefly to Figure 2, a computer system 200 is shown as a representative implementation for client systems 102 and server systems 104. Structurally, computer system 200 includes a bus 202 connecting a processor, or processors 204, and a memory or memories 206. An input/output device 208 is also connected to bus 202. Input/output device 208 represents a wide range of varying I/O devices such as disk drives, keyboards, modems, network adapters, printers and displays. Computer system 200 also includes a mass storage device

or mass storage devices 210 of any suitable type such as a hard disk, optical disk, magneto-optical disk, flash or other non-volatile storage system. In general, it may be appreciated that host computer system 200 is intended to be representative of general purpose computers. Computer system 200 is intended to be representative of a wide range of computer types. Thus, some implementations of computer system 200 may not require each structural component shown in Figure 2. For example, in the case where a television-compatible Internet system or network computing system is selected as a client system 102, mass storage device 210 may be unnecessary.

In network 100 of Figure 1, each server system 104a through 104c includes a relevant application. These applications are NNTP server application 106, chat server application 108 and mail server application 110 for server systems 104a through 104c, respectively. Due to these applications, server systems 104a through 104c will be referred to as NNTP server system 104a, chat server system 104b, and mail server system 104c. Importantly, network 100 may include any number of NNTP server systems 104a, chat server systems 104b, and mail server systems 104c.

NNTP server system 104a provides network news using the NNTP protocol described in Internet RFC 977 (the disclosure of RFC 977 is incorporated in this document by reference). Chat server system 104b provides access to chat forums using the Internet Relay Chat (IRC) protocol described in Internet RFC 1459 (the disclosure of RFC 1459 is incorporated in this document by reference). Mail server system 104c provides access to electronic mail using

a protocol such as the Simple Mail Transfer Protocol (SMTP) defined in Internet RFC 821 (the disclosure of RFC 821 is incorporated in this document by reference). In general, it should be appreciated that, although Figure 1 shows NNTP, IRC and SMTP protocols, the present invention is specifically intended to be used with a wide range of discussion technologies including BBS and Minitel technologies.

A preferred embodiment of the present invention includes a method and apparatus for providing an enhanced interface to discussion technologies within environments such as network 100. In general, the present invention is applicable to a wide range of differing discussion technologies. For purposes of description, however, the following description will focus on the use of the present invention as a method and apparatus for providing an enhanced interface to USENET news.

Structurally, a preferred embodiment of the present invention includes a client applet and a super-server application. These are shown as client applets 112a through 112c and super-server application 114 of Figure 1. For the described embodiment, client applet 112 functions as a user interface, or news reader, for USENET news. The user interface provided by client applet 112 is preferably screen-based, providing the user with a navigable series of screens. Each screen is a collection of information and graphics. The style and content of each screen depends largely on the particular implementation of the present invention. In many cases, a screen will include one or more links to other

screens. The user of client applet 112 activates these links to move between successive screens.

Within some of the screens provided by client applet 112, there are links to USENET newsgroups and links to categories. A category is a set of related USENET newsgroups. The user of client applet 112 activates a newsgroup link to access the contents of that newsgroup. A category link is activated to access a group of related USENET newsgroups and/or other subcategories.

Super-server application 114 maintains information about the users of client applet 112. Super-server application 114 also maintains information that is used by client applet 112 to construct its user interface. The information maintained by super-server application 114 is accessed by client applet 112 using a super-server protocol (SSP). Client applet 112 uses the information included in the SSP to provide the enhanced interface to USENET news.

NODE CLASS

The super-server protocol used by super-server application 114 and client applet 112 is a request/response message-based protocol. In some cases, these requests and responses require that data structures be passed between super-server application 114 and client applet 112. To simplify this process, client applet 112 and super-server application 114 include a Node class. Each instance of the Node class is identified by a unique integer id. The integer id functions as a portable method for referencing Nodes. In particular, the integer id means that the value used to reference a given Node does not differ between client applet 112 and super-server application 114. Thus, the Node referenced by the integer value five in client applet 112 is the same Node referenced by the integer value five in super-server application 114.

The Node class is an abstract data type that functions as a base class for a series of derived classes. Each derived class extends the Node class for a particular purpose. For example, to describe a screen, a derived class that includes information describing the screen is used. The derived classes include the attributes of the base Node class. As a result, the derived classes are identified by unique integer ids. For the sake of simplicity, the remainder of this document refers to Nodes without distinction between the various derived classes.

SUPER-SERVER PROTOCOL

Within the super-server protocol each request includes an integer value operation code. The integer value operation code is followed, when appropriate, by one or more operands. Each request has an associated response. The following table lists the operation code, the integer value of the operation code, the operands, and the response for each request included in a representative implementation of the super-server protocol:

operation code	value	operands	result
LOGIN	0	user name, password	boolean true or false
GET_HOME_SCREEN	1		Node instance associated with the home screen.
GET_NEWSGROUP	2	newsgroup name	
GET_SCREEN	3	Node id of screen	Node instance associated with the requested screen.
GET_READ_ARTICLES	4	newsgroup name	range of read articles
SET_READ_ARTICLES	5	newsgroup name, range of read articles	
GET_CANDIDATES	6		list of candidates to vote on
GET_VOTING_RESULTS	7	list of articles	list of voting results
VOTE	8	list of articles	list of votes

To authenticate a user, client applet 112 sends a LOGIN request to super-server application 114. The request includes, in order, the value zero, followed by strings for the user's name and password. In response to the LOGIN request, super-server application 114 returns a value of Boolean true if the user is allowed access and false otherwise.

For the described embodiment, a home screen is included. The home screen represents the top level in the screen hierarchy and functions as a starting point for users of client applet 112. To access the data corresponding to the home screen, client applet 112 sends a GET_HOME_SCREEN request to super-server application 114. The request is the value one and does not include any operands. In response to the GET_HOME_SCREEN request, super-server application 114 returns the instance of the Node class that describes the home screen.

To access the data corresponding to screens other than the home screen, client applet 112 sends a GET_SCREEN request to super-server application 114. The request is the value three followed by the integer id of the Node class instance associated with the desired screen. In response to the GET_SCREEN request, super-server application 114 returns the Node class instance that is associated with the id. The Node class instance includes information that describes the desired screen.

To access a particular newsgroup, client applet 112 sends a GET_NEWSGROUP request to super-server application 114. The request includes, in order, the value two followed by a string for the name of the desired newsgroup. Super-server application 114 responds by returning the Node class instance that corresponds to the particular newsgroup.

To get the range of already read articles in a particular newsgroup by a given user, client applet 112 sends a GET_READ_ARTICLES request to super-server application 114. The request includes, in order, the value four, followed by

a string that corresponds to the name of the newsgroup. Super-server application 114 responds by returning a string to client applet 112 that defines the range of articles that the user of client applet 112 has already read for the particular newsgroup.

To set the range of previously read articles in a particular newsgroup, client applet 112 sends a SET_READ_ARTICLES request to super-server application 114. The request includes, in order, the value five followed by a string that corresponds to the name of the newsgroup and a second string that defines the range of articles that the user of client applet 112 has read for the particular newsgroup. In response, super-server application 114 updates the range of articles that the user of client applet 112 has read for the particular newsgroup.

When a user votes on an article, he or she selects from a list of candidates such as "agree," "disagree," "funny," "spam," etc. To get the list of candidates that may be voted on by the user, client applet 112 sends a GET_CANDIDATES request to super-server application 114. The request is the value six and does not include any operands. In response, super-server application 114 returns a list of strings representing the candidates.

In order to display voting results to the user, client applet 112 must retrieve the results from super-server application 114. To retrieve the results, client applet 112 sends a GET_VOTING_RESULTS request to super-server application 114. The request includes, in order, the value seven followed by a list of strings representing the message-ids of the articles for which voting results are to be retrieved. In response, super-server application 114 returns a list of

objects representing the voting results for each of the articles specified in the request.

In order to record a user's votes, client applet 112 sends those votes to super-server application 114. To send the votes, client applet 112 sends a VOTE request to super-server application 114. The request includes, in order, the value eight followed by a list of strings representing the message-ids of the articles for which votes are being sent, followed by a list of objects representing, for each article, the candidates for which the user voted. In response, super-server application 114 records and tabulates the vote internally for inclusion in responses to future GET_VOTING_RESULTS that super-server application 114 will receive.

SUPER-SERVER APPLICATION

Super-server application 114 is preferably implemented as a Java® program. As shown in Figure 3, super-server application 114 includes a database 300 and a request handler 302. Database 300 is used to store information for the users of client applet 112. This information includes the ranges of articles that users have read in particular newsgroups. User preferences may also be maintained as part of database 300. Database 300 is also used by super-server application 114 to maintain the user interface information that is used by client applet 112.

Request handler 302 is called by super-server application 114 to process requests received from client application 112. In response to a request, request handler 302 first determines the super-server protocol operation code of the

request. Based on the operation code, request handler 302 performs or calls the functions required to implement the server side of the super-server protocol.

Figure 1 shows a single super-server application 114 within network 100. It may be preferable to include multiple super-server applications 114 in network 100. This is especially true in cases where load-balancing or automatic failover functions are required.

CLIENT APPLET

Client applet 112 is preferably implemented as a Java® applet. Client applet 112 is also preferably downloaded on demand from a server system 104 included in network 100. Once downloaded, client applet 112 is executed under control of a Java®-compatible web browser, such as Microsoft Internet Explorer, or Netscape Navigator®. Alternately, client applet 112 may be implemented using ActiveX or other programming languages. Client applet 112 may also be implemented as a standalone application that functions without the aid of a web browser.

As shown in Figure 3, client applet 112 includes a user interface package 306 and a client package 308. Client package 308 includes, in turn, an NNTP package 310, a chat class 312, a mail class 314 and a super-server class 316. User interface package 306 provides the user interface for client applet 112. NNTP package 310, chat class 312, mail class 314 and super-server class 316 provide client applet 112 with the ability to communicate with NNTP server application 106, chat server application 108, mail server application 110 and super-server application 114, respectively.

HTML CLIENT AND SERVER

In general, although the use of Java®-compatible browsers is becoming relatively common, many older, non-Java®-compatible browsers are still in use. Furthermore, some users choose to disable Java® in their Java®-compatible browsers. To address this situation, an alternate embodiment of the present invention is provided. Use of the alternate embodiment of the present invention may be better understood by reference to network 400 of Figure 4. In more detail, it may be seen that network 400 includes many of the elements of network 100 of Figure 1. Network 400 differs, however, because client system 102c includes an HTML client 402 and server system 104e includes an HTML server application 404. HTML server application 404 may be implemented using any appropriate technology such as Java®.

Within network 400, HTML server application 404 functions as a pseudo-client of super-server application 114. Instead of interacting with a user of client applet 112, however, HTML server application 404 functions as a provider of HTML web-pages within network 400. The web-pages provided by HTML server application 404 mimic the user interface provided by client applet 112. This provides non-Java® enabled browsers, such as HTML client 402, with an enhanced interface that is similar to the look and feel provided by client applet 112.

USER INTERFACE

A first screen of the user interface provided by client applet 112 is shown in Figure 5 and generally designated 500. As shown in Figure 5, screen 500 is intended to be an opening or welcome screen and is displayed when client applet 112 is invoked by a user of client systems 102. Screen 500 includes a series of icons, of which icons 502a through 502c are representative. Each icon 502 corresponds to a particular category or grouping of network newsgroups and chat forums and other subcategories. Clicking on a particular icon 502 is intended to activate the corresponding category. Screen 500 also includes a search box 504 activated by a search button 506. Search box 504 allows the user to enter a search request in the form of a text string. Clicking on search button 506 activates a search engine, causing the search engine to locate one or more categories and/or newsgroups that are related to the text entered into search box 504.

In Figure 6, a second screen of the user interface provided by client applet 112 is shown and generally designated 600. Screen 600 is displayed by client applet 112 whenever the user activates the business category by clicking on business icon 502c. Screen 600 includes a series of icons 602a through 602c. Each icon 602 corresponds to a newsgroup that is included in the business category. Importantly, each icon 602 includes text that describes, in a easily comprehensible fashion, the subject matter of the associated newsgroup. Importantly, instead of a single newsgroup, each icon 602 may also represent a grouping of articles selected in a logical manner from multiple newsgroups.

Screen 600 also includes a series of icons, of which icons 604a through 604c are representative. Each icon 604 corresponds to a sub-category that is included in the subject matter of the business category.

In Figure 7, a third screen of the user interface provided by client applet 112 is shown and generally designated 700. Screen 700 is exemplary of the screens that are displayed by client applet 112 when the user activates one of the newsgroups included in screen 600. Screen 700 includes a number of topics 702. Each topic 702 corresponds to a "thread" or a group of one or more network news articles taken from a particular network newsgroup.

Each topic 702 includes a title 704 describing the subject matter of the associated network news articles. Each topic 702 may also include a visual status attribute 706. When appropriate, visual status attribute 706 informs the user that he or she has already read all of the articles included in a thread (as in the case of visual status attribute 706a). Alternatively, visual status attribute 706 may inform the user that a particular thread includes articles that have been posted subsequent to the time that he or she last accessed the newsgroup (as in the case of visual status attribute 706b). Other visual status attributes 706 may be appropriate in other situations.

Each topic 702 may also include a visual voting indicator 708. The visual voting indicator represents an outcome of a voting process among users of the super-server protocol. In particular, visual voting indicator 708 indicates the overall outcome among users who have voted on the content of a particular thread. Visual voting indicator 708 may be a "thumbs up" symbol, as in the case

of visual voting indicator 708a or a "thumbs down" symbol, as in the case of visual voting indicator 708b. Thumbs up and thumbs down may be mixed in a single icon to indicate a mixed vote, as in the case of visual voting indicator 708c. Visual voting indicator 708 may also use other symbols and icons, as in the case of the happy face used for visual voting indicator 708d. Visual voting indicator 708 may also be a "spam" can to indicate that a particular article is needlessly posted to a wide range of newsgroups. Preferably, topic 702 will also include a count of unread articles 710.

Screen 700 also includes a series of resource icons 712. Clicking on a resource icon 712 activates a resource available within network 100 that is related to the subject matter of screen 700. For example, clicking on resource icon 712a activates a chat forum related to stock investments. Clicking on resource icon 712b causes the contents of a frequently asked questions (FAQ) file relating to stocks to be displayed. Resource icon 712c is linked to an interactive shopping area, such as a web page, for goods and materials related to stocks. Resource icon 712d is linked to a web page with links (possibly user-contributed) to other web pages related to stocks.

In Figure 8, a fourth screen of the user interface provided by client applet 112 is shown and generally designated 800. Screen 800 is entered when a user activates a topic 702 included in screen 700 and functions as a browser for the articles included in activated topic 702. Screen 800 includes text 802 that corresponds to one of the articles included in activated topic 702. Screen 800

also includes a next button 804 and a skip button 806 that allow the user to navigate through the various articles included in activated topic 702.

Reply button 808, post button 810 and save button 812 allow the user to respond to the displayed article (using email to the author and/or by posting a response), post a new article and save the displayed article, respectively. Voting buttons 816a and 816b allow the user to vote to agree or disagree with the displayed article. Voting button 816c allows the user to indicate that the current article is "funny" or humorous. The particular voting choices are representative. Thus any relevant voting criteria could be used. Thus, voting buttons could be included to indicate that a particular article is offensive or that a particular article is needlessly posted to a wide range of newsgroups (i.e., the article is "spam").

Screen 800 also includes an advertisement area 818. Preferably, advertisement area 818 is used to display ads or promotional offers that are targeted to match the subject matter the articles included in activated topic 702. The display of advertisements within advertisement area 818 is preferably timed to remain onscreen for a predetermined time period. The display for a predetermined time period enhances the likelihood that an advertisement displayed within advertisement area 818 will be read by the user.

Author information 820 is displayed within screen 800. Typically, author information 820 will include data identifying the author of the displayed article such as the author's name and email address. In some cases, a graphic image of the author may be displayed to help identify the author. Additional information, such as the article's postdate 824 or a map showing the article's origin 822 is

also preferably included in screen 800. Voting icon 826 shows how users have voted for the displayed article. In the case of voting icon 826, it may be seen that users have responded favorably to the displayed article. It may be appreciated, however, that a "thumbs-down" or other voting icons, will be appropriate for other articles. The various resources 712 included in screen 700 are included in screen 800 as well.

EXTENSIONS

The preceding description of the features and user interface provided by client applet 112 is intended to be representative of the possible features and user interfaces enabled by the cooperation between super-server application 114 and client applet 112. Importantly, the cooperation between super-server application 114 and client applet 112 enable the features and the user interface of client applet 112 to be extended beyond the preceding description in numerous ways. The following section is intended to describe at least some of these extensions.

Client applet 112 may be extended to include a better hierarchy than the existing USENET hierarchy. The existing USENET newsgroup hierarchy includes nonsensical "words" such as "alt," "soc," "comp," "rec," among others. Within client applet 112 this is replaced with newsgroup names that uses full English words and are more descriptive of the newsgroup contents. Newsgroups can also be accompanied by graphical icons that the user can click on to visit a newsgroup or a category containing several newsgroups or other categories. These extensions are implemented by storing the improved hierarchy within

super-server application 114 and downloading it to client applet 112 on the fly as required (including possible prefetching down and caching the hierarchical graph from the point where the user currently sits). Alternately, the improved hierarchy may be stored within client applet 112 and updated, when required, by downloading a new copy of client applet 112 to client systems 102.

Client applet 112 may be extended to provide access to all newsgroups at all times. More specifically, client applet 112 may be extended to include a text entry box to allow users to perform a text search for a newsgroup or newsgroups of interest. Super-server application 114 may be configured to store much more information about each newsgroup than is provided normally by NNTP server application 106. Consequently, searching can be much more complete than permitted by the traditional USENET architecture. Searching could also include searching of newsgroup contents by running a pre-indexing pass over the articles contained in each newsgroup. Alternatively, searchable information may be stored within client applet 112 and updated, when required, by downloading a new copy of client applet 112 to client systems 102.

Client applet 112 may be extended to provide user-friendly introductions of new newsgroups. A special "new groups" section of the improved newsgroup hierarchy can be included to help introduce users to newsgroups that have been newly created or newly added to the improved hierarchy. A newsgroup could remain in the "new groups" section until a user sees it once or some fixed number of times, or it could remain in the "new groups" section for a certain number of days. Being in the "new groups" section does not preclude the

newsgroup from being included in the permanent part of the improved hierarchy simultaneously. The "new groups" section could include more detailed descriptions of the newsgroups as well as their usual (improved) names since the topic may be new to the user. Information defining the "new groups" section may be stored within super-server application 114 and accessed by client applet 112 using the super-server protocol. Alternatively, the same information may be stored within client applet 112 and updated, when required, by downloading a new copy of client applet 112 to client systems 102.

Client applet 112 may be extended to provide easy-to-access descriptions of newsgroups. In the improved newsgroup hierarchy, the user could have access to a somewhat more verbose and detailed description of the contents or charter of each newsgroup or category of newsgroups available to the user at the user's current position in the newsgroup hierarchy. Newsgroup descriptions may be stored within super-server application 114 and accessed by client applet 112 using the super-server protocol. Alternatively, the same information may be stored within client applet 112 and updated, when required, by downloading a new copy of client applet 112 to client systems 102.

Client applet 112 may be extended to augment the newsgroup hierarchy with resources other than newsgroups. These additional resource may include links to Web pages pertaining to the category, text or multimedia documents pertaining to the category (e.g., reference materials, video clips, sound clips), live chat rooms pertaining to the category, lists of products or companies pertaining to the category, answers to frequently asked questions pertaining to the

category, etc. The hierarchy can therefore act not just as a way to navigate to newsgroups pertaining to topics of interest to the user, but as a general mechanism for navigating to all online resources pertaining to those topics. Information describing the additional resources may be stored within super-server application 114 and accessed by client applet 112 using the super-server protocol. Alternatively, the same information may be stored within client applet 112 and updated, when required, by downloading a new copy of client applet 112 to client systems 102.

Client applet 112 may be extended to indicate (or to display only) those messages selected by "editors." Users can designate themselves as editors for particular newsgroups or all newsgroups. Editors can include personal information about themselves and a mission statement for perusal by other users. The articles the editors select are then made available to all users. The information about each editor and the list identifying the articles he or she selects is stored within super-server application 114 and distributed to client applet 112 as requested.

Client applet 112 may be extended to provide voting by users on each article. Users can vote on each article. Typical entries they might select from include "I agree with this article," "I disagree with this article," "this article is funny," etc. Many other entries are possible. In fact, entry types may even be selected by the user writing the original article on which other users are voting. The entries may be accompanied by iconic representations of the sentiment, e.g., a thumbs up icon, a thumbs down icon, or a happy face icon. A summary of

voting results for each thread (a group of articles with the same subject) can be presented with the subject on the screen from which the user selects the thread to read. The summary may or may not be represented graphically; for instance, lots of "I agree" votes could be represented by a large thumbs up icon, while a few "I disagree" votes could be represented by a smaller thumbs down icon. The entries for each article and the number of votes for each entry for each article are stored within super-server application 114 and distributed to client applet 112 as requested.

This voting mechanism may also be applied to content other than articles, including but not limited to newsgroups, advertisements, email messages, and web sites. Voting on email messages is useful when the same email message is sent to many recipients, such as when a mailing list is used to send a message. The entries selected from and the number of votes for each entry for each content item (e.g., advertisement, email message, web site, etc.) are stored within super-server application 114 and distributed to client applet 112 as requested.

Client applet 112 may be extended to provide flexible filtering of undesired content, such as undesired articles, newsgroups, advertisements, email messages, and web sites. This allows a user to customize his or her view of the content by specifying two lists: "show only content with these characteristics" and "don't show content with these characteristics." To each list the user can add authors, dates, search string in the subject line of messages, search string anywhere in the body of messages, content selected by individual editors, voting

results, and/or keywords. Other criteria are possible as well. Preferably, a user's filtering criteria are stored within super-server application 114. Filtering itself is also preferably performed within super-server application 114. In this way, the expense and time of filtering large amounts of text over a slow network connection (such as a modem) is avoided.

Client applet 112 may be extended to provide collaborative filtering of messages. One criterion on which newsgroup filtering could be based is whether a particular article and/or thread was read (and perhaps voted positively on) by other users who share similar tastes to the user of client applet 112. For each user, super-server application 114 determines those other users whose set of read articles/threads overlaps significantly, and those other users who vote similarly on articles. Each user can then use this information as a filtering criterion, for instance, to show him or her only those articles read by other people with similar tastes.

Client applet 112 may be extended to provide a summary screen that shows the first few unquoted lines (quoted lines are lines included from other messages for the purpose of responding to them) of each article in a thread or newsgroup. A user could then go directly to a complete view of any message he or she finds interesting by clicking on the summary lines for that article. The performance of this feature is greatly enhanced by including summary information within super-server application 114 and downloading when needed, to client applet 112. In this way, client applet 112 avoids having to download all of the articles to be summarized from NNTP server application 106. This is

especially true when a slow network connection (such as a modem) connects client applet 112 and NNTP server application 106.

Client applet 112 may be extended to provide live WWW links. Any URLs (Uniform Resource Locators) contained within the text of articles can be made "live" when they are displayed, that is, the user can click on them and send his or her Web browser to the network location specified by the URL.

Client applet 112 may be extended to show the face (or face chosen by author) and personal information of the author. Users would fill out a user profile with as much or as little personal information as they like. This information would then be available to other users reading articles from authors who have provided a user profile. The user profile could include business-card type contact information (e.g., name, company, address, phone, fax, email address, etc.), resume-type information (skills, experience, education, etc.), and personal information (e.g., interests, hobbies, requests for information, etc.), and other free-form information, the nature of which could be determined by the user. The user profile could also include the face of the user. The face could be a digitized photo, or the user could select from a number of provided graphical depictions of faces or photo-realistic faces, or the user could construct a face by interactively selecting eyes, a nose, a mouth, hair, glasses, face shape, etc. The information about each user is stored within super-server application 114 and distributed to client applet 112 as needed.

Client applet 112 may be extended to provide easy access to the original article of a thread. Often a user may want to read the initial article that started a

thread of messages that are posted as replies. This feature allows the user to indicate that he or she wants to access the original article in the thread; client applet 112 then automatically determines which article is the original, and displays it.

Client applet 112 may be extended to provide easy access to an original article that has been quoted. If a user is reading an article that includes text quoted from another article, the user could go to the complete text of the quoted article by clicking on the quote. Super-server application 114 may be configured to store articles for a longer period of time than the NNTP server application 106. In this case, access to quoted articles would be maintained for periods that exceed the traditional USENET architecture.

Client applet 112 may be extended to provide smart font control in articles. The software can do some smart parsing of the articles displayed to the user, normally displaying them in an easy-to-read proportionally spaced font, but switching to a monospaced font if the presence of a lot of white space such as tabs or multiple spaces indicates that columnar information is included in the article. The monospaced font, which would allow columns to be aligned correctly, could be used only for the embedded columnar information in the article, or the entire article could be displayed in a monospaced font if any columnar information is detected in the article.

Client applet 112 may be extended to provide users with the capability to read different newsgroups differently. Possibilities include threaded versus non-threaded (i.e., whether or not all articles of a given subject are collapsed into a

single heading with that subject), sorted by date, sorted by author, sorted by voting results, sorted by selection by individual editors, sorted by number of editors selecting the article, sorted by popularity (super-server application 114 may be configured to maintain popularity information for each article or thread), articles and/or threads including one or more search strings within the subject line of the article/thread, and articles and/or threads including one or more search strings within the body of the article/thread. The performance of this feature is greatly enhanced by sorting the articles within newsgroups within super-server application 114 and downloading the results to client applet 112. In this way, client applet 112 avoids having to download all of the articles to be sorted from NNTP server application 106. This is especially true when a slow network connection (such as a modem) connects client applet 112 and NNTP server application 106.

Client applet 112 may be extended to provide easy access to "frequently asked questions" lists. Many newsgroups include a "frequently asked questions" or FAQ article that is posted periodically by a person who has volunteered to maintain the article. The article includes questions that new participants in a newsgroup frequently ask, along with answers that have been offered by the newsgroup participants in the past. Unfortunately, inclusion of FAQs within the articles of newsgroups means that FAQs may not be easy to find. Worse, since the articles included in newsgroups regularly expire and are purged, it may not be possible to find a newsgroup's FAQs at all times. To avoid this difficulty, the client application 112 could be configured to include a link, or similar device, that

allow users to easily access the FAQ article without having to find it in a long list of articles. When the link is activated, the client application 112 would automatically retrieve the FAQ from the NNTP server application 106 or super-server application 114. Importantly, by storing information describing the location of each FAQ within super-server application 114, it becomes possible for a human to verify the correctness of each FAQ. Specifically, it becomes possible to verify that each FAQ is actually the correct FAQ article for its associated newsgroup.

Client applet 112 may be extended to provide an ability to join an associated chat group. Each newsgroup could have a corresponding chat group, or several corresponding chat groups pertaining to subtopics of the newsgroup. While reading a newsgroup, client applet 112 could indicate to the user how many people are chatting live about the topic in a corresponding online chat group or chat room. Client applet 112 could additionally indicate which users are currently chatting. Client applet 112 could also indicate if the author of the article the user is currently reading happens to be currently chatting (even if the author is chatting in a chat group corresponding to a different newsgroup from the one the user is reading). Client applet 112 could then allow the user to join the chat group if he or she desires. The chat groups would be hosted on super-server application 114 or chat server application 108, and client applet 112 would communicate with super-server application 114 and/or chat server application 108 in such a way that would allow the user to participate in the chat group.

Client applet 112 may be extended to provide custom newsgroups created by applying filtering criteria across several newsgroups. This allows a user or the administrator of super-server application 114 to create a custom "newsgroup," which though it appears as a newsgroup to the user, isn't really a distinct newsgroup carried by NNTP servers. Instead, the custom newsgroup is an aggregation of messages that meet a set of criteria specified by the user or the administrator of super-server application 114. He or she can specify the newsgroups or part of the improved newsgroup hierarchy across which the specified filtering criteria is applied. Using this mechanism, a user or administrator can create what appears to be a custom newsgroup that consists, for instance, of all articles in all newsgroups related to stock investing that include the word "penny." As another example, a moderator may review all of the articles posted to one or more newsgroups. Articles deemed to be appropriate for children, or some other audience, would be included in a custom group.

When custom newsgroups are used, topics 702, included in screen 700, may be culled from multiple newsgroups. For example, topic 702a might be associated with a thread found in a newsgroup related to stocks that are traded on domestic stock exchanges. In the same example, topic 702b might be associated with a thread found in a newsgroup related to stocks that are traded on foreign stock exchanges.

Like other filtering tasks, the custom newsgroup feature is best implemented within super-server application 114. This keeps client applet 112

from having to download many articles from different newsgroups in order to apply the selection criteria.

Custom newsgroups can optionally be "moderated," in which all messages posted to the custom newsgroup are first sent to a human moderator for approval. Only messages approved by the moderator are then made available to the users reading the custom newsgroup. This feature may be used, among other purposes, to create custom newsgroups intended for children so that a human can filter out any objectionable postings before they reach the custom newsgroup readership comprised of minors.

Client applet 112 may be extended to provide newsgroup creation by users. This allows a user to start a newsgroup on the topic of his or her choice. Though it appears as a real newsgroup to the users, a newsgroup is not created within the USENET hierarchy stored on NNTP servers. Instead, the newsgroup is completely hosted on super-server application 114 and all articles posted to the newsgroup are stored within super-server application 114.

Client applet 112 may be extended to provide for the migration of mailing lists to newsgroups. This allows the maintainer of an email list to set up a newsgroup (as discussed previously) and create a gateway between his or her mailing list and the newsgroup. This gateway operates as follows: every message posted to the newsgroup is mailed to the members of the mailing list, and every message posted to the mailing list is also posted to the newsgroup. In this way, the mailing list maintainer can migrate his or her users to a newsgroup, where a large volume of posted messages will not clutter users' mailboxes.

Client applet 112 may be extended to provide private newsgroups. This allows users to create a newsgroup (using the previously discussed "newsgroup creation by users" feature) and specify a list of users or IP domains or IP address subranges that are allowed to access the newsgroup. The user could select whether the newsgroup is to be encrypted or not. If it is, then all information related to the newsgroup that is transmitted over the Internet is encrypted by the sender and decrypted by the receiver. This improves the degree of privacy offered by the newsgroup. As already discussed, super-server application 114 stores all of the articles posted to user-created newsgroups. In particular, both super-server application 114 and client applet 112 would include modules for encrypting and decrypting this information.

Client applet 112 may be extended to provide support for subgroups within a newsgroup. The improved newsgroup hierarchy could include subgroups within a newsgroup, or subgroups could be listed once the user has entered a newsgroup for the purpose of reading it. These subgroups would allow users to more quickly find articles of interest, especially in newsgroups with broad charters and high volumes of messages. Unlike the newsgroups described above in which articles are stored on super-server application 114, the articles in the subgroups are in fact the same articles in the newsgroup itself, and are therefore stored on the NNTP server application 106. The only indication that the articles belong to a subgroup is an additional line in the article header identifying the subgroup(s) to which the article belong(s). Super-server application 114 keeps track only of which subgroups exist, and where they sit in the newsgroup

hierarchy. When a user posts a message to a subgroup of a newsgroup, it is posted to the newsgroup itself with the header line identifying the message as belonging to that subgroup. People using the traditional USENET architecture software will see the message in the usual newsgroup. Users of client applet 112 can see the message in the subgroup. Optionally, users of client applet 112 may opt to turn off subgroups and read the message in the newsgroup itself.

Client applet 112 may be extended to provide support for creation of private article archives. The user can create one or more named archives. The archives contain articles the user decides to save in those archives. The archives can be nested within each other, forming a tree or graph of archives. The user can add and remove articles to/from his or her archives as desired. The names of the archives could be chosen by the user, or could be chosen automatically. If chosen automatically, the name of the archive could be the (improved) name of the newsgroup where the stored articles originated, and the archives could be stored hierarchically in a similar or identical structure to the improved newsgroup hierarchy, or could be maintained in a flat fashion. The articles in the archives, or a list identifying the articles in the archives, could be stored on the user's local disk or could be stored on super-server application 114.

Super-server application 114 may be configured to archive all newsgroups and articles (or a subset thereof). All or many newsgroups and articles can be stored within super-server application 114 indefinitely. This enables users of client applet 112 to search for articles from a pool of articles that may have long since expired from their NNTP server. In addition, it allows users who are short

on disk space or have no disk space (e.g., users with a dedicated Internet terminal with no internal disk, users connecting to the Internet through PDAs with no disk) to archive articles, since super-server application 114 can store either the articles archived by a user or a list identifying the articles archived by a user.

Client applet 112 may be extended to provide seamless searching of personal and global archives. A user may want to search the articles he/she has saved, or might want to search the complete archive maintained on super-server application 114. In other cases, the user will wish to search both archives perhaps with the articles he/she saved coming up first in the list of articles matching the user-specified search criteria.

Client applet 112 may be extended to provide publishing of personal archives for other users with or without annotations. A user could selectively make his or her personal archives available for other users to peruse. The personal archive could also contain personal annotations of the articles contained within the archive, allowing the user to put an editorial slant on his or her archive both by the articles he or she selects and by the annotations he or she adds to the articles. The archive, with annotations, would then be stored within super-server application 114.

Client applet 112 may be extended to provide an interface to local database engines. The search engine could be integrated to search not only archives stored on the user's local machine and super-server application 114, but also any databases maintained in the user's local environment. For instance, a company may maintain an internal SQL-based or Lotus Notes-based database

of articles and information pertinent to the company's business; when a user performs a search, the search engine could include a search of these resources.

Client applet 112 may be extended to provide automatic file stitching and decoding/playback. In newsgroups in which the primary purpose is disseminating alternate (i.e., non-text) media such as pictures and sounds, files are always encoded as text in some way (e.g., uuencode) and frequently split across multiple messages. Super-server application 114 and client applet 112 could automatically perform the necessary stitching of multiple messages (i.e., rejoining the messages that were originally split) and the necessary decoding to display or playback the non-text media type, thereby making these operations invisible to the user.

Client applet 112 may be extended to provide automatic file splitting and encoding. In newsgroups in which the primary purpose is disseminating alternate (i.e., non-text) media such as pictures and sounds, files are always encoded as text in some way (e.g., uuencode) and frequently split across multiple messages. If the user wants to post a message including non-text media to a newsgroup, client applet 112 could automatically perform the necessary encoding of the non-text media data and the splitting of the resulting encoding into multiple messages, thereby making these operations invisible to the user. In addition, client applet 112 could capture the alternate media directly (rather than first having to store it in a file) from the appropriate input device, such as a digital still or video camera, a frame grabber, a CD-ROM, a DVD (Digital Video Disk), a scanner, an audio CD, or a microphone.

Client applet 112 may be extended to provide media embedding in text messages. Client applet 112 can support the embedding of alternate media within normal text messages. For instance, a text article could be embellished with a diagram or photo or video clip. This can be encoded using the MIME standard for posting to the newsgroups; additional data or data of a type not supported by MIME can be stored on super-server application 114 and accessed by client applet 112 users.

Client applet 112 may be extended to provide for the embedding of formatting information in text messages. For instance, text messages could come with additional information specifying text font, size, color, style, and screen position, allowing the text to be displayed by client applet 112 in a formatted fashion rather than as raw text. This formatting information can be included inlined with the text (as in the HTML standard), or may be included separately in the header of the message or as a special footer in the body of the message text. Including the formatting separately allows the text to be read easily by users of newsgroup readers that do not support this formatting feature. Alternatively, the formatting information could be stored not in the article itself, but on super-server application 114, which would make the information available to client applet 112 on demand.

Client applet 112 may be extended to provide an ability to launch appropriate third-party viewers. Client applet 112 can recognize multiple media types and launch an appropriate viewing program for each type on the user's computer.

Client applet 112 may be extended to provide easy quoting of other (possibly multiple) messages. The software could allow the user to easily browse other messages in the same thread while composing his or her own message, making it easy though some user interface mechanism (perhaps drag and drop) to quote other messages in his or her own message.

Client applet 112 may be extended to provide spell-check before posting. Like many word processing packages, client applet 112 could spell-check the user's newly composed message before posting it to a newsgroup.

Client applet 112 may be extended to provide an ability to optionally choose an alternative text editor. If the user is not pleased with the text editor built in to client applet 112, or is used to his or her own editor and prefers it, the user should be able to optionally use an editor of his or her choice to compose messages. This editor could go beyond basic text and also allow editing of non-text media such as graphics, pictures, audio, video, etc.

Client applet 112 may be extended to provide facial expression embedding. The user could choose to embed any of a number of graphically represented facial expression icons within the text of messages composed by him or her. These icons could be used to enrich the expression of the message, by presenting a facial expression that conveys the emotion of the author, such as happy, sad, angry, joking, sarcastic, indifferent, etc. The graphical icons could be provided by the user, customized by the user, or selected from a menu of options provided by client applet 112. As posted to the NNTP server, the message could contain an equivalent "emoticon" (facial expressions currently

used frequently in USENET messages and represented by text characters in the normal ASCII character set), such as the sideways smiley face ":-)". To replace those emoticons with the richer more graphical equivalents, the necessary information indicating the selection and position of the graphical icons could be contained in the header of the posted message, or could be stored on super-server application 114. The data encoding the graphical icons themselves could be encoded into the message header or stored on super-server application 114. Alternately, the icons may be stored within client applet 112 and updated, when required, by downloading a new copy of client applet 112 to client systems 102.

Client applet 112 and super-server application 114 may be extended to provide anonymous posting. The user could choose whether his or her name is to be attached as the author to a message he or she posts, or whether the message is to be posted anonymously. The default as to whether posting to a newsgroup is anonymous or not could depend on the newsgroup to which the user is posting. The user could optionally include an email address where replies could be sent; this address would not be posted, but rather saved on super-server application 114, which would then forward any received replies to the specified address. Alternatively, replies could be saved in a private "newsgroup" (as we described before, this is not a newsgroup stored on the NNTP server in the traditional sense, but rather a newsgroup that is solely hosted on super-server application 114 but appears like a normal newsgroup to the user) accessible only by the user.

Client applet 112 may be extended to provide newsgroup ratings. Within client applet 112 this is implemented by including a mechanism (such as a series of buttons) that allows parents to rate each newsgroup. Alternately, ratings could be provided by a company or organization for the benefit of users of client applet 112. The ratings would indicate whether the newsgroup contains material deemed inappropriate for children. There could be separate ratings for each category of material that parents may want to block (e.g., sexual content, violent content, religious content, anti-religious content). The ratings for each newsgroup would be stored within the super-server application 114 and downloaded, on demand, to client applet 112.

Client applet 112 may be extended to display only selected newsgroups. Client applet 112 could allow parents to select which newsgroups are available to the user and which newsgroups are blocked from the user. The selection could be done on a per-group basis or in a blanket way based on the ratings given each newsgroup.

Client applet 112 may be extended to block individual articles and/or threads based on inclusion of selected words. Parents could instruct client applet 112 to block any articles and/or threads including a list of words deemed inappropriate for their children. Client applet 112 may be preconfigured with a default list of words, which could then be edited by the parents.

Client applet 112 and super-server application 114 may be extended to optimize their internal operations to account for link speed and user computer speed. By accessing system parameters and/or by sending a test message and

timing it, the client applet 112 and/or super-server application 114 can roughly determine the speed with which data can be transmitted to and from the relevant client system 102. By accessing system parameters and/or by performing a processor benchmark and timing it, client applet 112 can roughly determine the speed of the same client system 102. These two pieces of information can be used to optimize the user experience, given the constraints of his or her computing environment. For instance, the number of articles fetched by default when a user enters a newsgroup could depend on the link speed; users with faster links would receive more articles by default. In addition, super-server application 114 can shoulder more responsibilities for operations that would otherwise exceed the capabilities of the user's computer or communications link in the normal amount of time a user is willing to wait for a command to be performed.

Client applet 112 and super-server application 114 may be extended to allow automatic selection of the highest-performance super-server application 114. There may be many super-server applications 114 available within network 100 or on an external network, such as the Internet. But client applet 112 need not always choose to communicate with the closest super-server application 114. In some cases, client applet 112 may improve performance by communicating with a more distant super-server application 114. This could be the case if the nearest super-server application 114 is currently heavily loaded while more distant super-server applications 114 are less heavily loaded. It might also be preferable to communicate with a more distant super-server application 114 if

the link to the nearest super-server application 114 is heavily loaded or is completely down. By sending a test message requesting super-server application 114 status and timing its response every so often, client applet 112 can determine on-the-fly which super-server application 114 will offer it the best performance; client applet 112 could then switch from the super-server application 114 it is currently communicating with to the new super-server application 114, or could communicate with both super-server applications 114.

Client applet 112 and super-server application 114 may be extended to provide prefetching and caching based on article popularity and/or voting. One way to speed response time is to do the following: while the user reads one article, client applet 112 fetches the next articles the user is likely to read and stores them in memory, ready to display them without waiting for the network if the user does in fact request those articles in the near future. The selection of the next likely article may be performed by getting the next article from the current thread. Another option is to fetch articles that show very positive voting results, since the user may well look at articles that got a very positive response first. Super-server application 114 may also track which articles and/or threads are read most frequently by other users. Super-server application 114 can therefore inform client applet 112 as to which articles the user might read next, if his or her tastes are similar to the user base as a whole. Taking this a step further, if super-server application 114 finds a correlation between the articles the user typically chooses to read and the articles particular other users choose to read, then super-server

application 114 can use those other users as the set of readers on which to base predictions of which articles this user is likely to read.

Client applet 112 and super-server application 114 may be extended to provide prefetching based on direction from user. The user could specify, if possible, the order in which he or she will usually read articles, threads, and/or newsgroups. Client applet 112 can then use this information to guide its prefetching algorithm accordingly.

Client applet 112 and super-server application 114 may be extended to provide a "resource center" that adds additional areas to each newsgroup. Each resource center would be hosted on super-server application 114. These resources may be group-specific, so the newsgroup on client applet 112 can serve as a launching point from which the user can access the other resources. Examples of these resources include chat groups associated with the newsgroup and the FAQ associated with the newsgroup. Another resource could be a listing of events. This resource includes calendar listings of events with descriptions of the events. The events could be related to the topic of the newsgroup from which the user accesses the event listings. The events can be online events (e.g., online discussions, online panel forums, online conferences) or events held at a physical location and time (e.g., presentations, conferences, meetings, concerts, sporting events). The events themselves can be contributed either by users using a form provided as part of the client software, or by the administrators of super-server application 114.

Another resource could be a listing of classified advertisements. This resource displays classified advertisements. These ads could be related to the topic of the newsgroup from which the user accesses the classified ads. The area could be a simple list of ads, not organized in any particular fashion, or the ads could be grouped into categories (e.g., for sale, help wanted, employment desired, services offered) as traditional classified ads in a newspaper. The categories could be the same across all newsgroups, or the categories could be made specific for each newsgroup (e.g., "Condominiums for sale" could be a category in a real estate newsgroup). The ads themselves can be contributed either by users using a form provided as part of the client software, or by the administrators of super-server application 114.

Another resource could be a shopping area. In this area goods and services are sold to users. These goods and services are potentially related to the topic of the newsgroup from which the user accesses the shopping area. For instance, music Compact Discs could be sold in the shopping area accessible from the various music newsgroups. The user purchases items by typing in the necessary information for the vendor to complete the transaction. The goods and services for sale and their descriptions can be contributed either by users using a form provided as part of the client software, or by the administrators of super-server application 114.

Long-lasting documents are another possible resource. This area allows the users to access documents that are perceived to have lasting value beyond the amount of time articles are normally stored on typical USENET article

servers (e.g., NNTP servers). These documents are potentially related to the topic of the newsgroup from which the user accesses the documents area. These documents can be contributed either by users using a form provided as part of the client software, or by the administrators of super-server application 114.

Web links are yet another possible resource. This area allows the users to access links to World Wide Web pages. These links are potentially related to the topic of the newsgroup from which the user accesses the links area. These links can be contributed either by users using a form provided as part of the client software, or by the administrators of super-server application 114.

External Web link pages are still another possible resource. This area would be a World Wide Web page of World Wide Web links provided by a third party potentially unrelated to the client or super-server application 114. For instance, accessing this area might take the user to a page of links on a search service such as Yahoo, Lycos, or Excite. These links shown there are potentially related to the topic of the newsgroup from which the user accesses the external links area.

Client applet 112 and super-server application 114 may be extended to provide automatic connection to NNTP server application 106. By maintaining a database of NNTP server applications 106 on super-server application 114, the selection of the user's NNTP server application 106 may be made transparent to the user. That is, the user need not type in the network address or Internet domain name of his or her NNTP server application 106.

The database of NNTP server applications 106 may be constructed using a software utility program that scans the "Path:" lines in USENET article headers. Each Internet machine name found would be saved in the database. To connect to an NNTP server application 106, client applet 112 first sends a notification message to super-server application 114. The notification message informs super-server application 114 of the network address of client applet 112. Using this network address, super-server application 114 creates a corresponding domain name. Super-server application 114 then consults the database, looking up the name of NNTP server application 106 in the same domain. Super-server application 114 then transmits the hostnames of all NNTP server applications 106 found in the database to client applet 112. Client applet 112 then attempts to connect with the NNTP server applications 106. If the attempts by client applet 112 to connect with the NNTP server applications 106 all fail, only then must the user be queried for the name or address of his or her NNTP server application 106.

Other embodiments will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope of the invention being indicated by the following claims and equivalents.

CLAIMS:

1. A system for providing an enhanced interface to an online discussion technology, the system comprising:

a super-server application, the super-server application providing information that augments information otherwise available within the online discussion technology; and

a client applet, the client applet using the information provided by the super-server application to provide an enhanced interface to the online discussion technology.

2. A super-server application for execution by a server system networked to at least one client system to provide users of the at least one networked client system with at least one application for augmenting access to online messages, the super-server application comprising:

a request handling system for processing requests for online messages from users of client systems networked to the server system; and

a database for storing information relating to the requests of those users, wherein

the super-server application provides the users with an interface to the online messages based on the information stored in its database.

3. The super-server application of claim 2 wherein the database stores user-specific data used by the super-server application to provide customized user interfaces for specified users.

4. The super-server application of claim 3, wherein the user-specific data for a user is based on processed requests from that user.

5. The super-server application of claim 3, wherein the user-specific data is based on user input.

6. The super-server application of claim 3, wherein the user-specific data for a user is based on previously processed requests from a group of users.

7. The super-server application of claim 3 wherein the super-server application further includes a filter for filtering messages accessible to specified users based on their user-specific data.

8. The super-server application of claim 3 wherein the online discussion applications include existing newsgroups, and the super-server application further comprises a custom newsgroup filter for applying filtering criteria across existing newsgroups, identifying online messages within those newsgroups that satisfy the filtering criteria, and grouping those messages into a custom newsgroup.

9. The super-server application of claim 3 wherein online messages accessible by the online discussion applications are rated by users, and based on the user-specific data, the super-server application identifies online messages having ratings satisfying a predetermined criteria for transmission to users.

10. A client application for execution by a client system networked to a server system to provide users of the client system with at least one online discussion application for accessing online messages, the client application comprising:

a client package providing at least one online discussion application enabling the client system to communicate with a networked server system using the online discussion technology; and

a user interface package for providing customized user interfaces for enabling the client system to access online messages, wherein the user interfaces are customized based on use of the online discussion applications by users.

11. The client application of claim 10, wherein the networked server system downloads the client application to the client system in response to a request from the client system.

12. The client application of claim 10, wherein in response to a user request using an online discussion application in the client package, the user interface package displays links to information categorized by subject matter, including predetermined newsgroups provided by the online discussion application.

13. The client application of claim 12, wherein the user interface package displays a link as an icon.

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14. The client application of claim 13, wherein an icon includes a visual status attribute for indicating whether messages associated with the icon include messages not read by the user.

15. The client application of claim 13, wherein one visual status attribute is a voting indicator for indicating outcomes of voting by users accessing messages available through the link indicated as an icon.

16. The client application of claim 12, wherein a user selects a link to access information corresponding to the link.

17. The client application of claim 12, further comprising a browser to browse information corresponding to a link.

18. The client application of claim 12, wherein the link provides access to at least one web page.

19. The client application of claim 12, wherein the links include links to digital files, including files accessible from the client system and files accessible from the server system.

20. The client application of claim 12, wherein linked information may include embedded links to additional information.

21. The client application of claim 12, wherein the user interface package enables a user to customize the display of links according to user-specified criteria.

22. The client application of claim 10 further comprising a custom newsgroup filter wherein, in response to user-specified criteria provided by a user through an online discussion application, the client application determines existing newsgroups based on the user-specified criteria and groups into a custom newsgroup messages within those existing newsgroups that satisfy the user-specified criteria, and the user interface package provides a user interface for accessing to the custom newsgroup.

23. The client application of claim 10 wherein the online discussion applications allow a user at the client system to download online messages, the client application further comprising an archival system for storing messages downloaded to a user.

24. The client application of claim 23, wherein the archival system publishes a user's archived messages by making them accessible to other users and clients of the networked server system.

25. The client application of claim 10, further comprising a search engine for identifying sources of information accessible by the online discussion applications provided in the client package based on search criteria input by a user.

26. The client application of claim 25, wherein the search engine further searches databases maintained in the local environment of the client system.

27. The client application of claim 10, further comprising a blocking application for blocking access to information based on predetermined blocking criteria.

28. The client application of claim 27, wherein the blocking criteria is based on user-defined criteria.

29. The client application of claim 10, further comprising a server selector for estimating the performance of at least two server systems networked to the client system and selecting one server system based on the estimated performance.

30. The client application of claim 10, further comprising a caching application for automatically prefetching and caching messages based on predetermined criteria, without waiting for the user to request those messages.

31. The client application of claim 30, wherein the predetermined criteria include ratings for the messages and the caching application prefetches and caches messages having ratings above a predetermined threshold.

32. The client application of claim 30, wherein the predetermined criteria include relationships between messages, and when the client application downloads a first message to a user, the caching application prefetches and caches related messages.

33. The client application of claim 32, wherein related messages include messages corresponding to an embedded link in the first message.

34. The client application of claim 32, wherein messages include newsgroup articles and replies to articles, and messages related to a first message include messages that are replies to the first message and messages to which the first message replies.

35. The client application of claim 10, wherein the client package includes third-party application software.

36. The client application of claim 35, wherein the third-party software includes viewing applications for accessing messages.

37. The client application of claim 35, wherein the third-party software includes editing applications for editing messages.

38. A method for organizing online information for a user of a client system networked to a server system in an online discussion environment, comprising:

determining user-specific criteria;

applying the user-specific criteria to multiple existing newsgroups in the online discussion environment to identify messages within those existing newsgroups that satisfy the user-specific criteria; and

creating a customized newsgroup for accessing the identified messages.

39. The method of claim 38, wherein determining user-specific criteria is based on user input.

40. A method for customizing a user's environment and interface for accessing, reading and handling data and information available from a wide area network (WAN) such as Internet,

to which are connected at least a server system, a client system and a storage device,

characterized in that said method consists of :

- implementing on the said server a super-server application adapted to maintain and update information representative of the user's environment and interface, to handle requests sent by a user of the client system and to reply thereto,

- implementing on said client system a client applet adapted, as requested by the user, to (i) configure the user's interface, and/or (ii) organize data and information received from said wide area network through said super-server application, and/or (iii) create user's personal profile and incorporate same into data and information as received from the WAN, and/or (iv) select all or part of said data and information to request the saving thereof in said storage device, and

-implementing on the said server a database adapted, under the super-server application control and as requested by said client applet, to selectively, store,

update, order, and retrieve, on the one hand, information pertaining to the user's environment and interface, and on the other hand information received from said WAN and incorporating said personal profile created by the user.

41. A method according to claim 1, wherein the data and information received from the WAN are representative of articles included in newsgroups such as USENET newsgroups.

42. A computer system adapted to be used as a server system comprising at least a processor (204) and a memory (206) connected by a bus (202) and connected to a wide area network (WAN) such as Internet, said WAN also connected to at least a client system (102),

characterized in that said computer system is controlled by

a super-server application adapted to:

- cooperate with a client applet implemented on said client system and adapted, as requested by a user of the client system, to: (i) configure a user's interface, and/or (ii) organize data and information received from said WAN through said super-server, and/or (iii) create user's personal profile and incorporate same into data and information as received from the WAN, and/or (iv) select all or part of said data and information to request the saving thereof in said storage device,

- access, as requested by the client applet, a database adapted to selectively, store, update, order, and retrieve, on one hand , information pertaining to the user's environment and interface, and on the other hand information received from said WAN and incorporating personal profile created by the user, and

- maintain and update the information pertaining to the user interface, handle requests sent by the user and reply thereto.

43. Apparatus (102) adapted to be used as a client system connected to a wide area network (WAN) such as Internet, the WAN including at least a server system,

characterized in that said apparatus is controlled by a client applet adapted to:

- by itself: (i) configure a user's interface, and/or (ii) organize data and information received from said WAN through said server system, and/or (iii) create user's personal profile and incorporate same into data and information as received from the WAN, and/or (iv) select all or part of said data and information to request the saving thereof in said storage device, and

- in cooperation with a super-server application controlling said server system, handle a database adapted to selectively store, update, order, and retrieve, on the one hand, information pertaining to the user's environment and interface, and, on the other hand, information received from said WAN and incorporating personal profile created by a user of the client system, said super-server application being adapted to maintain and update the information pertaining to the user interface, handle requests sent by the user and reply thereto.

44. The system of claim 1 wherein online discussion technology includes USENET discussion groups.

45. The system of claim 1 wherein online discussion technology includes email.

46. The system of claim 1 wherein online discussion technology includes Internet chat.

47. The system of claim 1 wherein online discussion technology includes voicemail.

48. The system of claim 1 wherein online discussion technology includes videomail.

49. A method for operating a computer system to customize a user's ability to access, read and handle data and information available from a wide area network (WAN) such as the Internet characterized in that said method consists of:

- executing on data available from the wide area network a pre-indexing pass in accordance with a pre-determined criteria, and
- establishing, as part of a database, a first hierarchy of information based on the data resulting from the pre-indexing pass.

50. The method of claim 49 wherein the pre-determined criteria is based on keywords.

51. The method of claim 50 wherein the first hierarchy is provided on a superserver.

52. The super-server application of claim 2 further including a new groups section.

53. The super-server application of claim 2 wherein the names of newsgroups are common words or phrases.

54. The invention of claim 49 wherein the hierarchy includes resources other than newsgroups.

55. The super-server application of claim 3, wherein the user-specific data for a user is based on messages selected by editors.

56. The super-server application of claim 3 wherein the user interface includes a message summary.

57. The super-server application of claim 3 wherein indicia associated with the author of a message are displayed with the message.

58. The super-server application of claim 3 wherein a link is provided to the original article of a thread.

59. The super-server application of claim 3 wherein a link is provided to an article quoted in a message.

60. The super-server application of claim 3 further included smart font control in articles.

61. The super-server application of claim 3 further including different reading preferences for each newsgroup.

62. The super-server application of claim 3 further including a link for access to frequently asked questions.

63. The super-server application of claim 3 further including access to a chat group associated with a message.

64. The super-server application of claim 3 further including permitting users to create pseudo-newsgroups.

65. The super-server application of claim 3 further including a mail-to-news gateway.

66. The super-server application of claim 3 further including permitting private newgroups.

67. The super-server application of claim 3 further including permitting subgroups within a newsgroup.

68. The super-server application of claim 2 wherein the request handling system further augments information otherwise available within the online discussion technology.

69. The client application of claim 10 wherein the online discussion applications allow a user at the client system to download online messages, the client application further including one or more archival systems for storing messages.

70. The client application of claim 10 wherein the online discussion applications allow a user at the client system to download online messages, client application further including an archival system for storing messages on the server.

71. The super server application of claim 3 further including permitting a client to establish one or more private articles archives on the server.

72. The super server application of claim 3 further including permitting storage of all newsgroups and articles on the server.

73. The super server application of claim 71 further including permitting a user to search
the associated private archives and all wide area network resources in a single command.

74. The client application of claim 70 wherein one or more personal archives may be published for other users.

75. The super server application of claim 3 further including providing an interface to database engines maintained locally.

76. The super server application of claim 3 further including automatic file decoding and playback.

77. The client application of claim 10 further including automatic file decoding and playback.

78. The super server application of claim 3 further including embedding media in text messages as directed by the user.

79. The super server application of claim 3 further including providing newsgroup ratings.

80. The super server application of claim 3 further including providing a resource center in each newsgroup.
81. The super server application of claim 3 further including automatic connection to an associated NNTP server.

82. A local area network (LAN) comprising at least a server system and at least a client system, connected to a wide area network (WAN) such as Internet,

characterized in that :

- said server system is controlled by an application so-called « super-server application », adapted to maintain and update information pertaining to a user's environment and interface, to handle requests sent by the user of the client system and to reply thereto,

- said client system is controlled by a client applet adapted, as requested by said user, to: (i) configure the user's interface, and/or (ii) reorganize data and information received from said WAN through said super-server, and/or (iii) create user's personal data and incorporate same into data and information as received from the WAN, and/or (iv) select all or part of said data and information to request the saving thereof in said storage device,

- said client applet is adapted to send requests to, whereas said super-server application is adapted to handle, a database implemented on said server system in order to, selectively store, update, order, and retrieve , on the one hand , information pertaining to the user's environment and interface, and on the other hand information received from said WAN and incorporating personal data created by the user.

The Patent Office

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Claims searched:	1	**Date of search:**	19 August 1998

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G4A (AFGDX)

Int Cl (Ed.6): G06F 17/30, H04L 29/06

Other: Online: COMPUTER, INSPEC, WPI.

Documents considered to be relevant:

Category	Identity of document and relevant passage				Relevant to claims
X, E	EP 0820028	A2	(Lucent Technologies)	Whole document	1at least
X, P	EP 0803826	A2	(Sun Microsystems)	Whole document	1at least
X, P	EP 0798655	A2	(Sun Microsystems)	Whole document	1at least
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X	Computer Database Abstract Accession No. 01864431 & Computer Shopper, v15, n12, p660(2), Dec, 1995				1at least

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